

American Artisan

**THE WARM AIR HEATING
AND SHEET METAL JOURNAL**

FOUNDED 1880



This beautiful small home recently completed in the Pittsburgh area is roofed with tin. The architect who designed the house and the sheet metal contractor who laid the roof are both proud of the result. A story on the selling, designing and painting of this roof is in this issue.

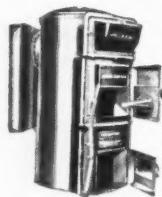
AUGUST 17, 1931

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THREE is ample evidence to show that the *best* warm air installation is the one that gives its owners the advantages of a modern, improved warm air system, combined with the cleanliness and convenience of automatic oil heat.

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INDEX PAGES—8 and 48

[VOL. 100, No. 17]

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Scientists Translate

Famous Egyptian Papyrus



(Found in the Valley of Kings and recently translated)

"Who the (untranslatable) put that sheet metal canopy over Osiris? Not two years old and rusty already. Feed that (untranslatable) punk to the sacred crocodiles. I told him to use GOHI (pronounced go-high) because I want it to last until 1931."

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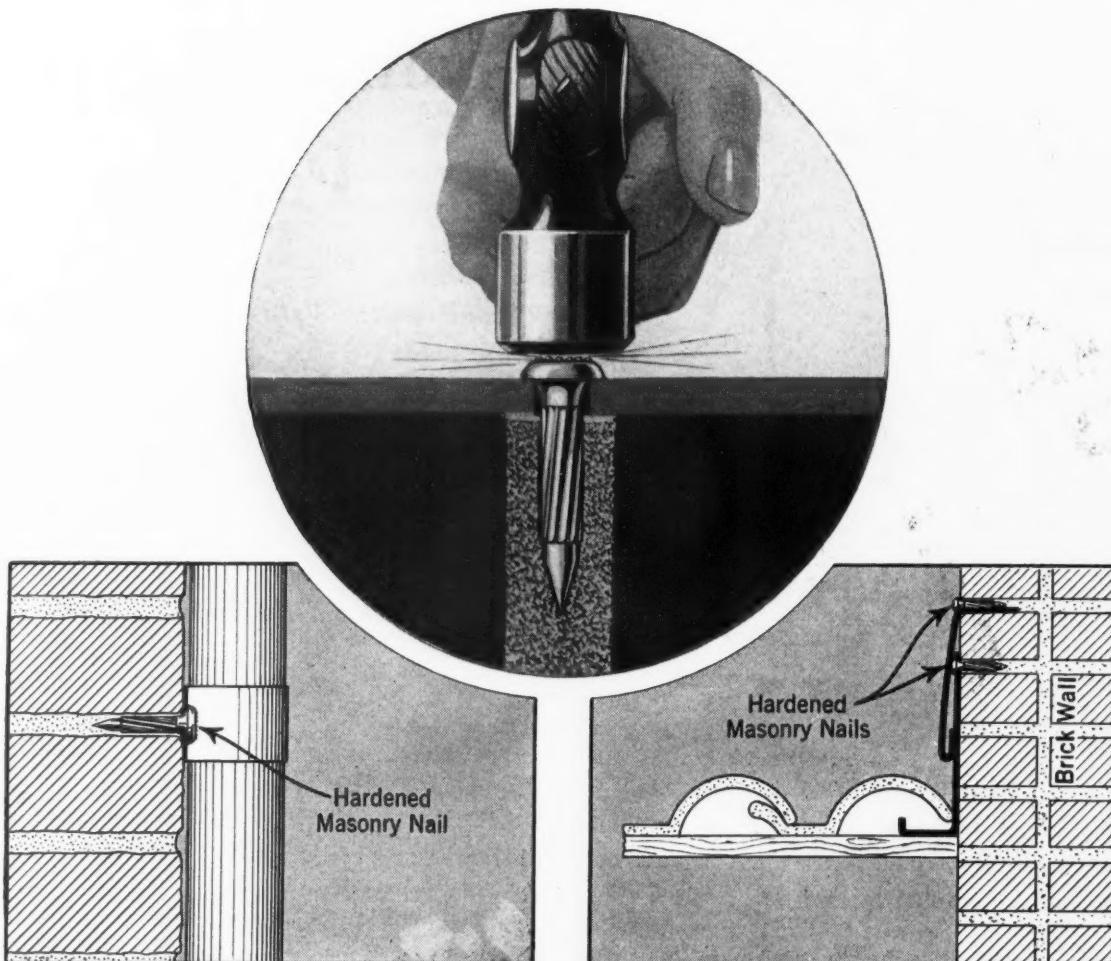
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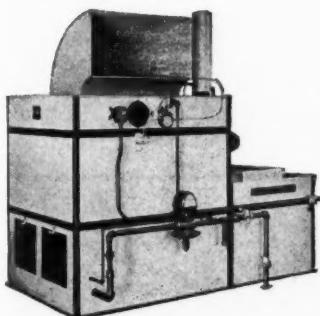


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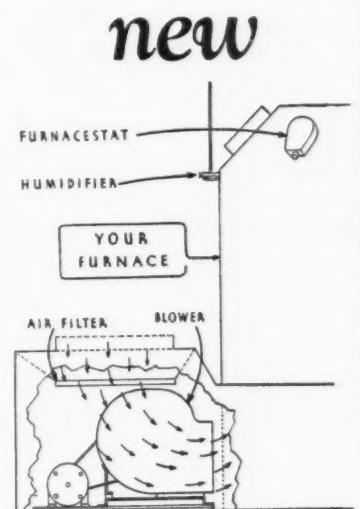


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American Artisan

THE WARM AIR HEATING AND SHEET METAL JOURNAL

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IN
Gravity Warm Air Heating
Forced Warm Air Heating
Sheet Metal Contracting
Air Conditioning
Industrial Roofing
Merchandising
Ventilating

Member of the Audit Bureau of Circulations

VOL. 100, NO. 17

AUGUST 17, 1931

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Volume 100

American Artisan

THE WARM AIR HEATING
AND SHEET METAL JOURNAL

Number 17

Certified Heating Contractors

THIS depression has opened our eyes to a lot of things.

One thing which has been forcibly impressed upon most of us is the fact that there are far too many under-financed, under-organized and poorly established firms or individuals trying to do warm air heating.

There probably isn't a community in the country where the local heating situation isn't complicated by a few individuals who are selling furnaces out of a kit of tools and the home garage.

Most of these men are ex-mechanics who were let out of a local shop and set themselves up in business by getting a furnace or two on consignment. Most of these individuals have just enough financial standing to buy a second hand car on time. They are satisfied with enough work to bring in the equivalent of the wages they made as mechanics.

They haven't the slightest notion of what overhead, bookkeeping, financing, merchandising are all about and what is more they don't want to know. Their whole idea is to make a bare living.

If they have a cleaner, they do cleaning at prices which no legitimate contractor can compete with. The jobs they do are terrible, but while they last they keep good contractors from getting work. And after they have passed out of the picture they leave a black mark against the whole warm air fraternity.

The heating installations they put in may be good mechanically, but the prices they get won't permit them to design an adequate job so they skimp on pipe sizes, return airs, and every extra which can be left out and still have a fire burn in the fire pot.

Most of these men haven't the slightest idea of how to design a system to meet the owner's requirements. They are accustomed to work to the plans prepared by the "boss" and not worry why he did this or that.

In brief, they make it tough for every legitimate heating firm.

We all know these things are true. Most contractors

are right now faced with this situation and will continue to be unless some drastic step is taken.

It is all very well to sit back and say—"Well, he won't stay in business long, anyway." But the trouble is that as soon as one of these fly-by-nights is on his way, another takes his place.

AMERICAN ARTISAN proposes that the only feasible way to combat this practice is to adopt a system like that of the plumbing industries.

What we need is Certified Warm Air Heating Contractors.

Who such Certified Contractors shall be can be determined by a board of recognized heating men—one or two contractors, an engineer, a financial man or a credit man. Such a board will be strictly local in character so that the members can readily ascertain all the facts about the man who wants a certificate. The candidate should be compelled to pass an examination to establish his ability to design a good heating system; he should be rated financially or make clear that he has adequate backing so that his installations will be guaranteed; his mechanical and moral standing should be established and his past experience and operations investigated and passed upon.

If this candidate is successful in passing the examination he can then be educated in the need of getting enough money for his jobs to keep him in business. Any fly-by-night scheme he starts could be checked in its beginning by the threat of taking away his certificate.

Of course such an organization would have to be sanctioned by law. That's where our local and state and national organizations enter the picture. Too many such organizations are now trying to live without having any definite reason to offer heating men why they should belong to the local organization. No organization can exist without something to work for.

The field is here. The need is pressing. The organizations to start the ball rolling are already in existence. What is needed is the men and the aggressiveness to make things move.



The house is long, with large roof areas and much glass exposure

Fully Accessoried Forced Air Heats This Costly Country Home

AN unusually good example of what a 1931 model forced air heating system can offer the owner of the large and elaborate house has just been completed some 21 miles outside St. Louis by Wm. A. Tipton, Inc., St. Louis warm air heating contractor.

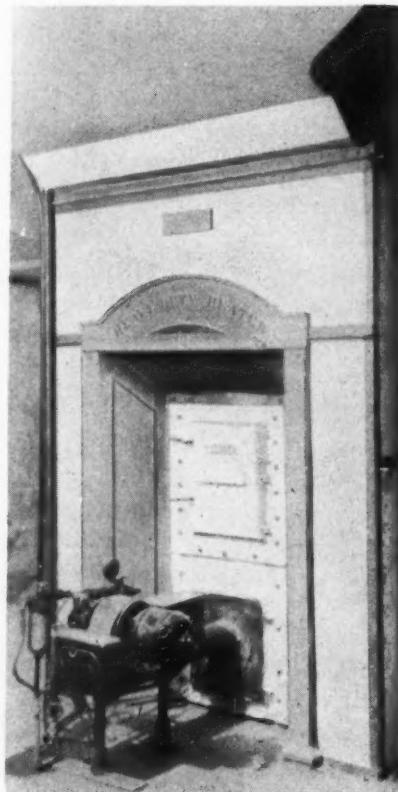
Wm. A. Tipton, for whom the firm was named, died six years ago. Since that time the business has been conducted by Mrs. Tipton with the assistance of an engineer. Mrs. Tipton has kept the business running just as it did under the direction of her husband and in addition has adopted all the newest and most progressive ideas, merchandise and knowledge the warm air industry has uncovered.

This particular installation embodies several unusual features of design. It also ranks high in the excellence of its design and the quality of its workmanship. It dis-

plays nicely the advantages, economies, conveniences and adaptability of a warm air heater coupled to a blower, filters, oil burner and full automatic control.

The setting for this system is an old house purchased with many acres of land to be the country home for a St. Louis business man who has delved deeply into stock raising, crop culture and whose house is his workshop for many diversified activities. Little remains of the framework of the original house. The new structure which stands on the old foundation has some 20 rooms, including a garage, office, library and all the other necessary rooms for a large household.

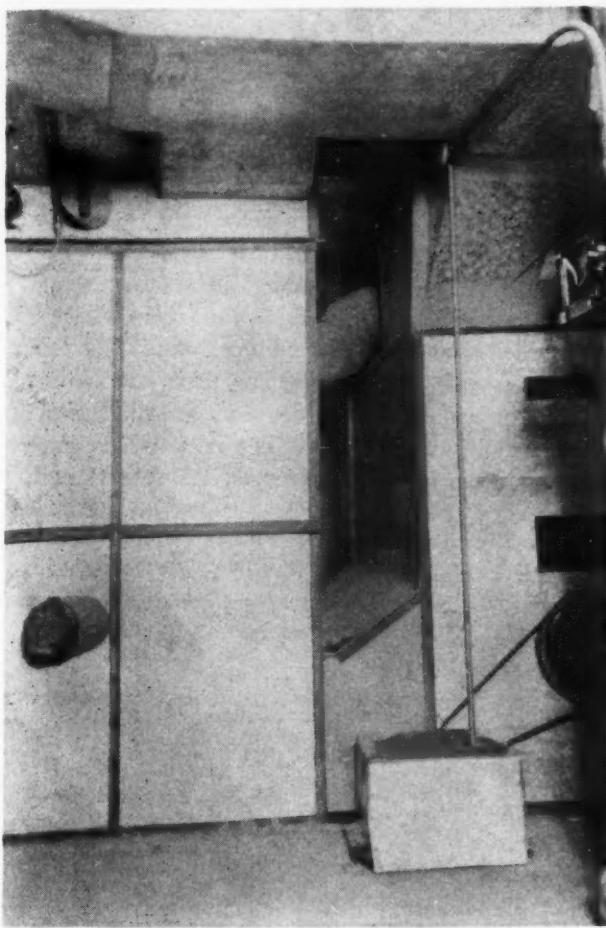
The interior of the house includes such features as a wood paneled dining room and living room, hand painted walls in the halls, baths and dressing room, special fixtures



This is the front of the heater

throughout and every modern convenience.

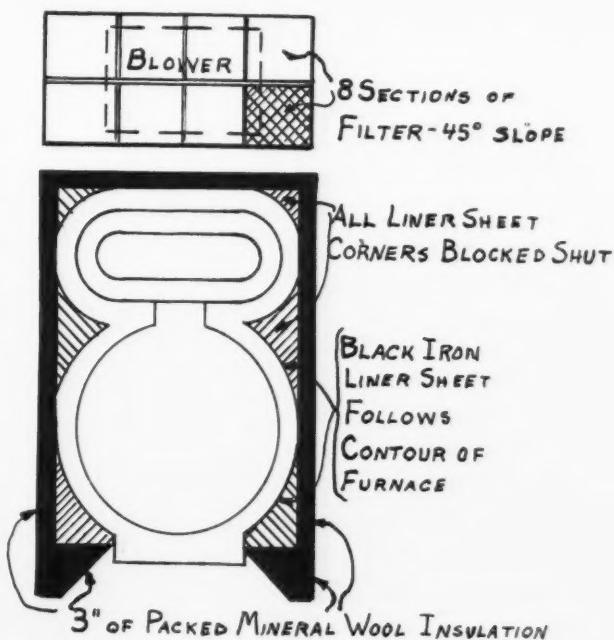
The heating system had to follow these high standards of design. There could, for instance, be no trace of dirt coming through or around the registers, for even a slight amount of greasy dirt would spoil hand painted walls. The circulation of warm air and the extraction of used air had to be unfailing for the exposed site and large exterior areas demands continuous heat. So also the heat sup-



ply had to be constant and operate with a minimum of attention. And of course the system had to be designed to work.

Several interesting innovations appear in this system. There is, for instance, the specially designed casing for the furnace. As shown in one of the details, this casing consists of an outside angle iron frame to which is fastened cross crimped sheets. This casing is square, two panels high and three panels deep. Three inches inside this outside

The special casing consists of two sheets of metal packed tight with three inches of mineral wool. A liner sheet follows the contour of the furnace and radiator, curve for curve. The blower housing is also special



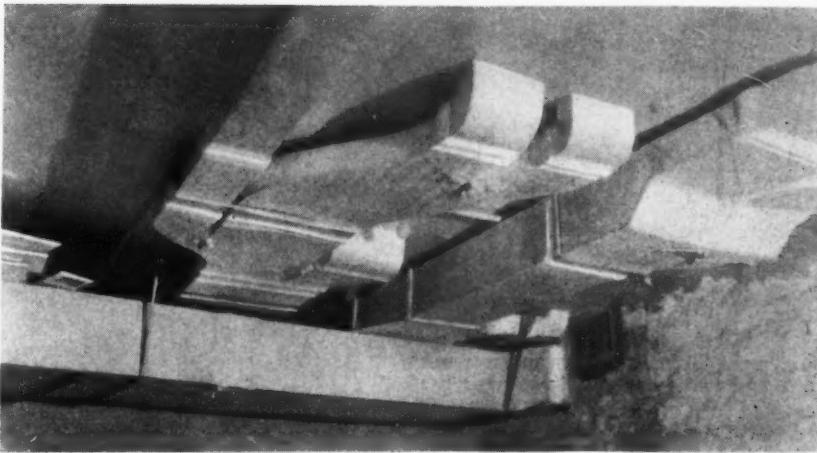
This is a side view of the furnace and the blower. The filters are placed in a peaked double row above the cage of the blower. The casing sheets are supported by the angle iron frame

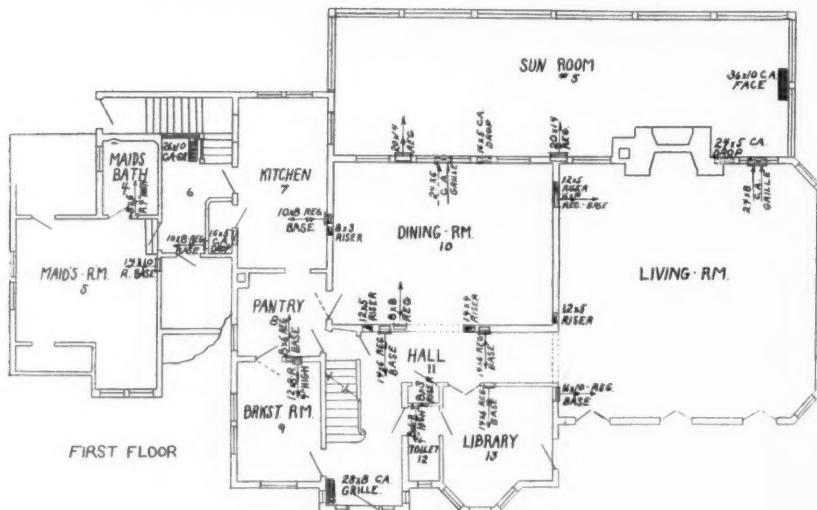
Below is a view of some of the trunks in the basement. A damper is placed at each branch to balance the system and control temperatures

shell there is another similar casing supported by another angle iron frame. The three inches between this outer and inner casing is packed tight with mineral wool. This heavily insulated casing is placed quite a distance out from the furnace and the drum radiator—too far out to make an efficient air passage for a forced air job.

Inside this casing there is a reflecting liner which follows the contour of the furnace and radiator so closely that there is just the same space between this sheet and the combustion dome as between the radiator at the neck and the sheet. The top and bottom of this baffling is blocked off so that no air flow occurs behind the sheet.

The blower and the filters are





This is the first floor. All inlets and outlets are in the baseboard

housed in a special case which stands behind the furnace and against the wall. All the return air is brought through rectangular ducts to the top of this housing and dumped into it above the filters. The blower which is a Miles No. 180 operating at 366 r.p.m. is placed on the floor. Above the blower, eight Reed filters are placed in two rows of four each across the housing. These sections of filter are peaked up like a roof where the two rows butt. The result of this arrangement is that the blower pulls air from all the rooms into the large

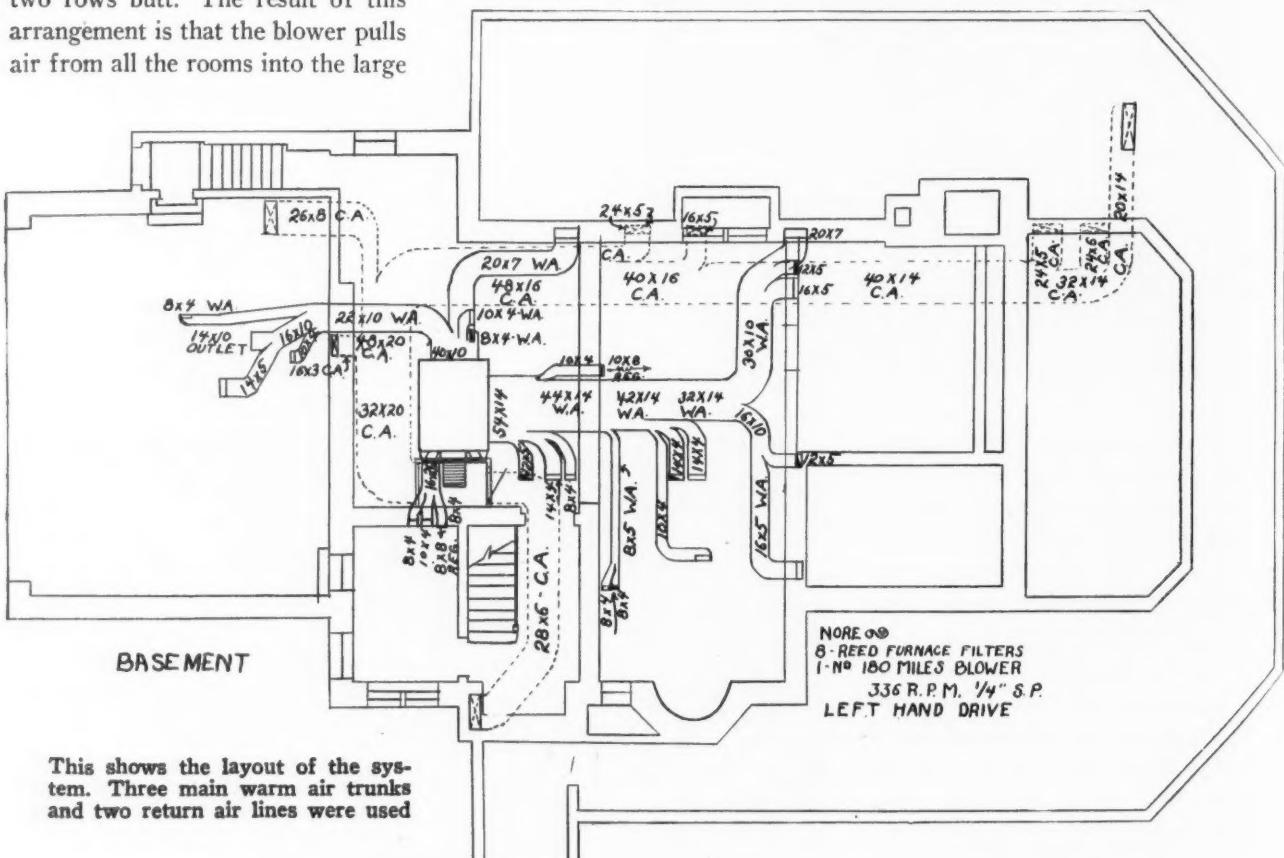
housing and from the housing through all the filter sections. It is hoped by this arrangement to eliminate filter sections which do not do any work.

An interesting feature of the house is the large sun room at the end of the second floor. This room is practically all windows and is finished inside in logs to resemble a room in a log house. There was no direct way to heat this room by means of either a floor or wall

register. A trunk was taken off the rear of the furnace and up to the attic floor. From this point it runs across the attic floor joists to a point at the center of the sun room where it discharges through a side wall grille. This duct is just under 70 feet from furnace to grille.

Since this attic space is not heated the duct is heavily insulated. Sheathing boards were first laid on the joists. Two sides of sheathing board were then built up and a top of boards prepared. The bottom was lined with a layer of balsam wool, then 4 inches of mineral wool to make 6 inches of insulation and on this padding the duct was laid. The same thickness of insulation was put on both sides and then on the top. When the case was completely packed the wood top was nailed down.

Another interesting room is the first floor sun room which opens off the dining room. This room has a stone flag floor laid on dirt and the three sides are all glass of small panes. The heat loss of this room as shown on the data sheet is tremendous—some 63,000 B.t.u.'s. To



This shows the layout of the system. Three main warm air trunks and two return air lines were used

NO.	ROOM	dimension	CUB. CONT.	C. F. M.	BSMT. W.A. 400 Yds.	RISER W.A.	COLD AIR	GASS ()	WALL ()	CEILING FLOOR ()	INFIL.	TEMP. DIFF.	B.T.U. LOSS	B.T.U. FOR VENT.	GRATE AREA	REG. TEMP.	FAN. NOS.
1	GARAGE	23x21x8	4968	196	71			198	298	—	4968	50°	20,300		4.84	#	
2	OFFICE	8x11x8	704	64	23			34	78	—	704	70°	5,180			180	MILES
3	LAUNDRY	14x29x8	3248	97	35			22	80	—	3248	"	7,910		Oil		BLOWER
4	M.BATH	6x7x8	336	51	19			9	95	42	336	"	4,180				360 R.P.M.
5	N.BED	13x15x8	1560	188	68			54	234	195	1560	"	15,330				1/4 S.P.
6	ENTRY	8x15x9	1080	104	38			21	132	120	1080	"	8,470				
7	KITCHEN	10x16x9	1440	102	37			26	109	90	1440	"	8,260				
8	PANTRY	8x10x9	720	35	13			5	67	—	720	"	2,800				
9	BRKST. RM.	9x12x9	972	113	41			43	146	72	972	"	9,240				
10	DINING	16x23x9	3312	57	21			—	—	—	3312	"	4,620				
11	HALL	12x17x18	3672	235	85			74	196	204	3672	"	19,180				
12	TOILET	3x7x9	189	12	5			3	24	—	189	"	980				
13	LIBRARY	10x12x9	1080	127	46			60	129	70	1080	"	10,360				
14	LIVING	25x27x10	6750	414	150			159	361	216	6750	"	33,810				
15	SUN PORCH	13x46x10	5960	781	282			515	155	596	5960	"	63,840				
16	BED RM.	10x16x8	1280	152	55	55		38	202	160	1280	"	12,390				
17	BATH	8x10x8	640	62	23	23		11	77	80	640	"	5,040				
18	BED RM.	14x15x8	1680	142	51	51		40	80	210	1680	"	11,550				
19	BATH	8x10x8	640	62	23	23		11	77	80	640	"	5,040				
20	BED RM.	15x25x8	3000	332	120	120		100	348	315	3000	"	27,090				
21			4323	3326	1206												
22	C.F.M. = B.T.U. X .55																
23																	
24	T.R. X 60																

Heat losses were entered on this data sheet. Note the huge loss for the sun room

heat this severe exposure two 20 by 7 trunks supply the necessary heat discharging the air from the half way point and at one end. A return air grille located in the floor at the other end furnished the means for circulating the air through this room. The drop in temperature between warm air and return air grilles will be more in this room than any other point in the house.

The equipment used in this house consists of a Lennox 75-35-0 furnace bricked to use oil flame. The oil burner used is a Simplex of the gun type. In order to supply the necessary heat for this house the

burner consumes better than two gallons of oil per hour in zero weather. The operation of the burner is controlled from the first floor by a thermostat. The burner also has a safety temperature control in the bonnet so that the burner will shut off should the fan stop running or the electrical current go off.

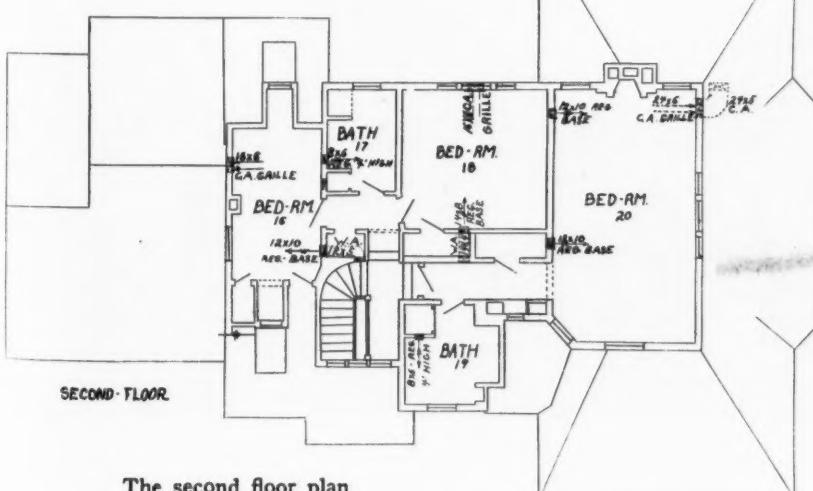
The blower operates from a bonnet Mercoid control set to start the blower at 235 degrees. This reduces to a temperature of 210 degrees immediately. The blower stops when

the temperature drops to 170 degrees.

The data sheet which is reproduced shows the essential losses for the building. Excepting for the first floor sun room, discussed previously, these losses are not unusually high. This is accounted for by the excellent construction of the house. It is interesting to note that no loss is calculated for walls, glass or ceiling of the dining room. This is because the sun room is warm and acts as a windowless wall.

The contractor had to conserve his labor costs on this job in every possible way. There could, for example, have been excessive hauling costs if he had attempted to form his ducts in the shop and truck them the 21 miles to the job. Instead, he took a brake and all necessary tools out to the house and set up right on the job. Material was hauled out flat rather than formed and saved much cost.

The heating system is comparatively simple for so large a house. From the furnace two large warm air trunks and one small one were taken from three sides. The largest of these trunks is 54 by 14 at the bonnet and reduces progressively as each of the 10 branches is taken off,



The second floor plan



The sun porch occupies almost all of the rear of the house. The heat loss on this porch is very large

The second largest trunk is 40 by 10 at the heater and is split into 6 branches, two of which show on the plan as going straight up off the trunk. The third trunk is split into 3 fingers almost immediately, one branch heating a corner of the basement and the other two the breakfast room and pantry on the first floor.

Runs of warm air are shortened wherever possible by placing the registers on inside walls. This is especially noticeable on the second floor and the main wing of the first floor where practically all the registers and second floor stacks come up within a few feet of the central point of the main axis. The rear rooms were not so easy to shorten, but here again inside wall registers were used.

The return air side of the plant collects most of the cooled air from one side of the house, the north. The air is collected in two trunks, the shorter one of which connects with a floor grille located at the foot of the servants' quarters stairs. The longer trunk collects air from two of the upstairs bedrooms and from the living room, sun room and dining room on the first floor. The third return air trunk connects with a large floor grille placed just inside the main entrance door and at the foot of the stairs.

This collection system leaves the

library, kitchen, breakfast room, maid's room on the first floor and the bath and hall on the second floor without a direct return to the blower. However, these rooms are for the most part small and open into rooms which are connected to the blower.

The garage, which is attached to the rear of the house, is heated by one 14 by 10 inlet located at the ceiling. No return air is taken out of the garage, nor is it vented, but it has doors at the front and a row of windows at the back which is counted on to provide exit for the slight pressure built up by the blower.

With the exception of the first

floor sun room all registers are of the baseboard type set into special baseboard panels and painted to match the woodwork of each room. Each branch is dampered where it leaves the main trunk—first to balance the system and second to control any desired change in temperature later by increasing or reducing the volume of air introduced into the room.

The data sheet which is reproduced shows most of the essential mathematics of the job. The coefficients used for heat loss are 1.1 for the glass, .3 for the wall, which is equivalent to stucco on sheathing with uninsulated studding and plaster on wood lath, .3 for the ceiling and .02 for the infiltration. In addition to these coefficients, which are generous, a 15 per cent safety factor is added. This safety factor alone, in this big house, accounts for more than 40,000 B.t.u. supply.

All the registers used are pressed steel with the valves left in. The return airs are also stamped steel, but with the valves taken out. The stacks are all single wall and it is worth noting that several of the partitions in this house were made thick enough to take a 5-inch stack.

In addition to the heating system the Tipton company also had the contract for the copper decks, gutters, flashings, etc. This amounted to better than \$1,000, as all the roof decks are copper.



On the second floor is another large porch with practically all glass walls. The duct which supplies heat traverses the full length of the attic

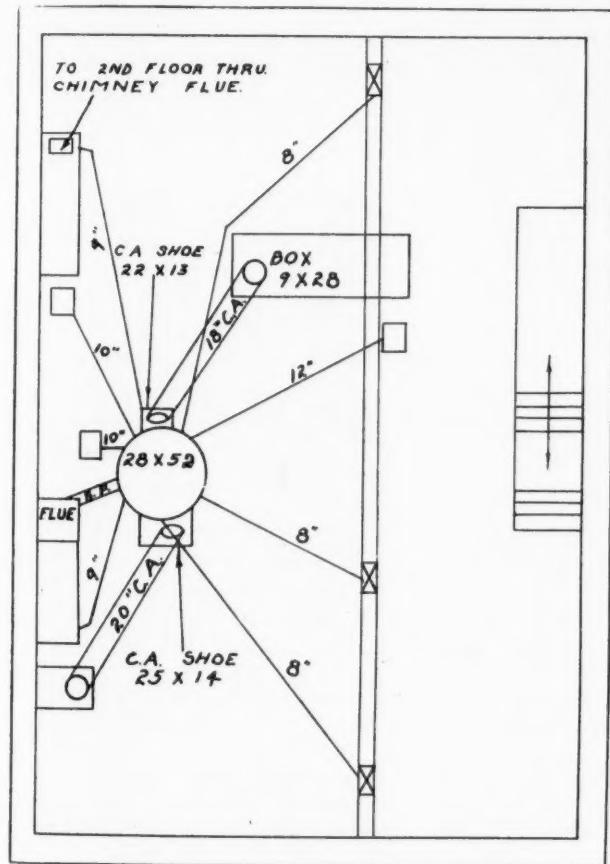
Help Us Out on This Problem, Will You?

SHOWN with this article are the floor plans for a trouble job which a reader would like some help on.

Here is what the contractor says about the installation:

"When a cold snap comes the owner finds it uncomfortable to stay in his parlor because of drafts coming from the hall. These air currents seem to come from the hall and enter the dining room to drop through the cold air grille there."

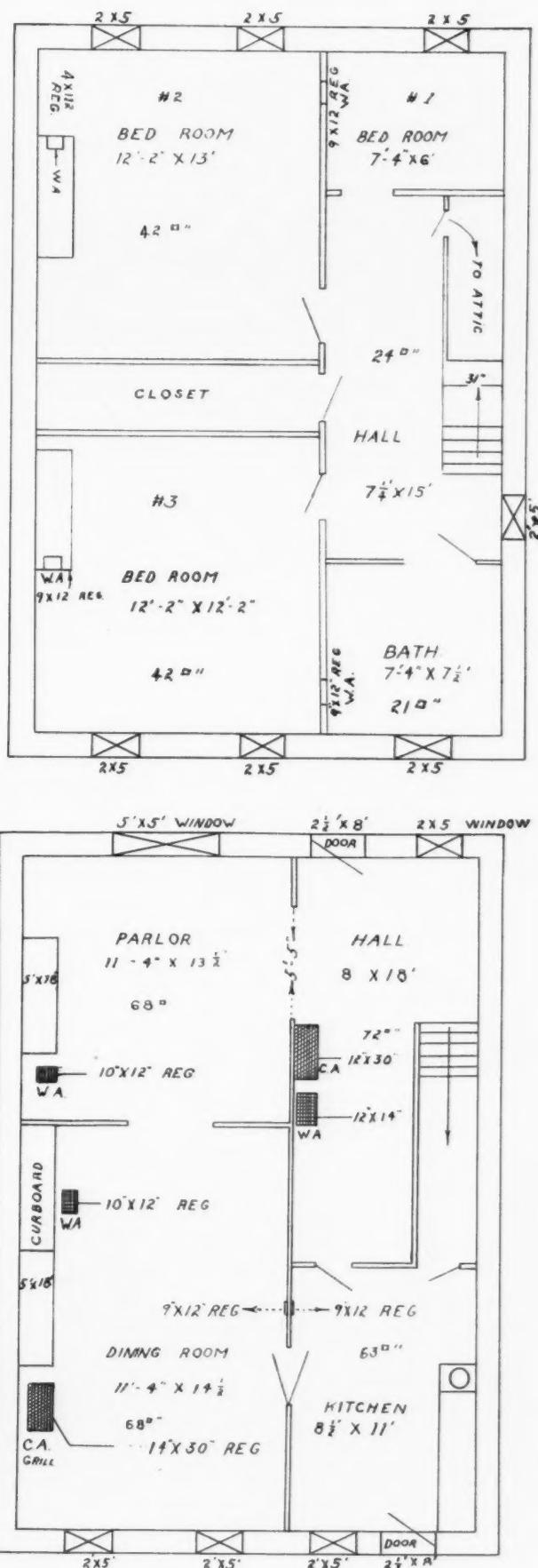
"Also the owner finds it difficult to heat bedroom No. 1."



The reader has checked the job over and says that it seems to be according to Standard Code.

The layout was sent to a furnace manufacturer's engineering department which reported that they thought the furnace a trifle small and suggested moving the return air grille into the living room and making it larger. They also reported that bedroom No. 1 was hard to heat probably because there was not enough pitch to this pipe.

Look this problem over and let us have your suggestions. It might be well to check the job against your way of figuring and see if the installation checks large enough.





Looking down the main roof deck. The peaked wings and the dormers show at the right. Much soldering was required on this deck

THE Cleveland Board of Education will shortly be housed in a new Administration Building located in the Civic Center. This new building conforms in general architecture with the other buildings of the group—dignified design, stone exterior and excellent handling of the building masses.

The structure also follows another practice adopted in buildings of this group—careful attention to every detail which effects maintenance and permanence. Contributing largely to this elimination of maintenance and trouble is the large amount of copper and lead used to protect and sheath severely exposed areas.

The copper was used on the roof. The lead was used as protective flashing on all stone cornices, at window lintels and all stone belt courses. More than 27,000 pounds of 16-ounce copper and 82,000 pounds of lead were used by the sheet metal contractor.

The sheet metal contractor who fabricated and erected this large amount of metal is the Jacob Halter Sons Company, Cleveland. The building was designed by Walker and Weeks, Cleveland architects.

The roof, which is copper sheathed, is one of the dominating features of the architectural design. In outline the roof is elevated above the cornice high enough to permit the cutting through of louvres and on three sides high dor-

mers. From this eave the roof is batten type to the highest elevation where a flat deck, also copper covered, completes the roof of the main section. On the two wings the batten roof is peaked.

The Deck

One of the photographs shows a view of the flat deck. All the blanks were cut in small sizes with single edges turned for seams. All these seams were completely soldered on the deck, which operation in view of the area, 232 feet by 12 feet, required a large amount of hand work.

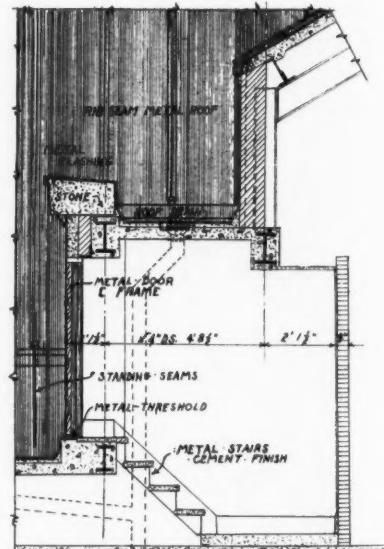
The edges of this deck are finished off with a special ridge which incorporates in its design a ridge, a drip, and suitable ornamentation. One of the details shows a cross section of this ridge. Two pieces of metal were used, the drip forming one seam and the joint at the top edge of the roof, the other.

Cleveland Protected

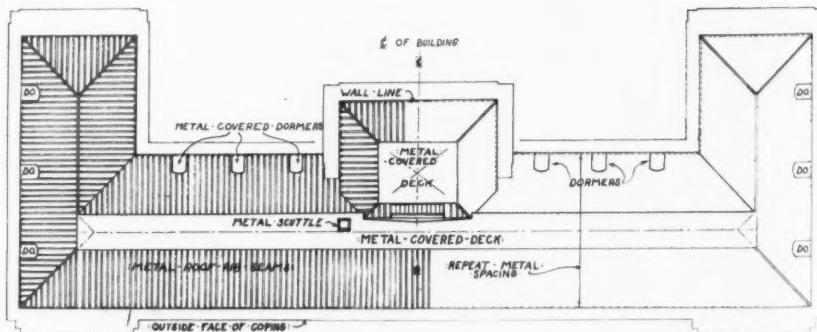
A ridge of identical outline was used on the two wings where the batten roofing is carried up to the peak and ridged.

The Roof

All of the roof from the ridges to the eaves is uniform batten type roofing. The battens used are of wood cut to provide expansion space behind the vertical face of the



A cross-section of a doorway opening onto a wide gutter. This detail shows the construction of the gutter, lead sheet over the stone cornice and the arrangement of batten roof and standing seam side walls



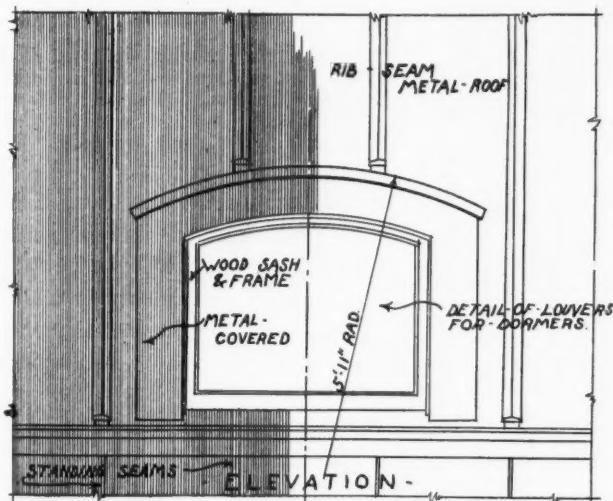
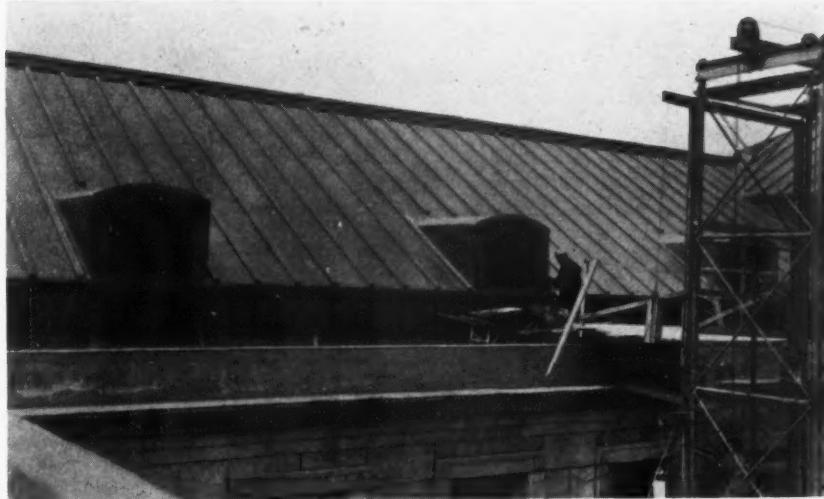
The plan of the roof shows the location of the dormers, the deck and the gutters. All the roof, excepting the two decks, is laid batten type

Board of Education Home By Tons of Copper and Lead

copper. The top is peaked very slightly, more for appearance than for utility. The separate cap is formed to make a double lock at the top of the batten sides.

The sheets and the cap are carried down to the end of the batten and turned around a small end blank cut to the outline of the batten. These ends were not soldered.

The pan sheets of the roof were all cut 10 feet long with edges turned for a single locked cross seam at the top and the bottom. These seams were not soldered.



The Dormers

On three sides of the building dormers are let through the roof. These dormers serve as ventilating louvres and in place of glass have copper louvre blades in the opening. The roof of the dormers is a flat arc having no ornamentation along the eaves and only a very slight projection at the front.

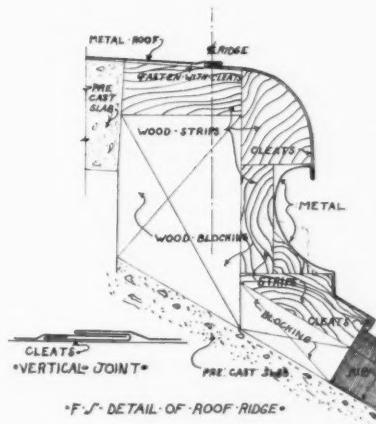
The top of these dormers is formed of small sheets single locked and soldered. The battens of the roof end at the dormer top.

The vertical face below the batten roof is sheathed in copper with standing seams corresponding in placement with the battens of the roof. Below the dormers on the three sides where there are dormers and at equal intervals on the back or fourth side, rectangular auxiliary louvred openings break the elevation. The blades of these louvres are identical with those of the dormers. This vertical copper face is carried down over the flashing sheet of the wide gutters.

Above is the front of the roof showing the loured dormers and side wall ventilators. The vertical walls have standing seam sheathing

Left is a detail of a dormer. The dormer roof is flat soldered sheets. The battens end at the dormer

The batten roof ends flush with the vertical sides. A two-step, slight projecting cornice, ornaments the eave of the roof. A cross section of this detail is shown in one of the drawings. This detail shows the attention taken to prevent water penetration. The sheet which forms the face of the lower step is carried up under the bottom roof sheet as shown. The bottom roof sheet is, in turn brought down over the face of the top step and turned into the drip. The bottom sheet is carried



The ridge of the flat deck is both ornamental and utilitarian. Note how the fabrication brings seams at drips



Looking down one of the eaves. This view also shows some of the large area of gutter which had to be soldered. The protecting sheet over the stone cornice is lead

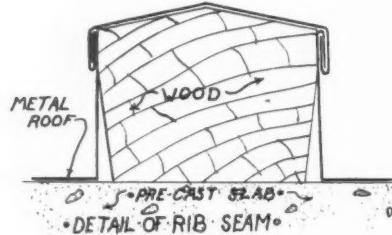
down behind the sheet which forms the face of the vertical side. The lower step of this cornice is again turned into a drip.

On the back side of the building several skylights are set into the roof. The construction of these lights is shown in one of the details. The metal work of the light is copper.

The Gutters

All around the roof gutters of varying widths are used. In some places this gutter is wide enough to be classed as a flat deck. The copper was cut in small blanks like those of the roof deck and all seams are soldered. These wide gutters are drained through the inside.

Quite a variety of cross sections were used on these gutters. In all cases the outside and inside sheets also form the bottom sheet of the two-piece flashing. The roof is pre-cast concrete pitched up at the

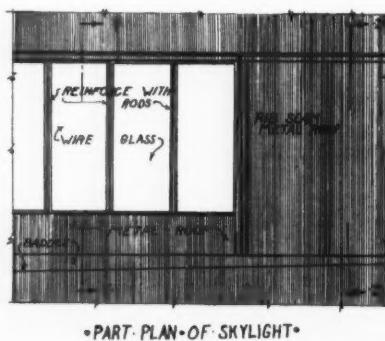


Detail showing batten construction. The separate cap was just slightly braked. The wood is undercut for expansion of the pan sheet

outside cornice and against the vertical face of the roof.

Lead Work

Practically all of the large amount of lead used on the build-

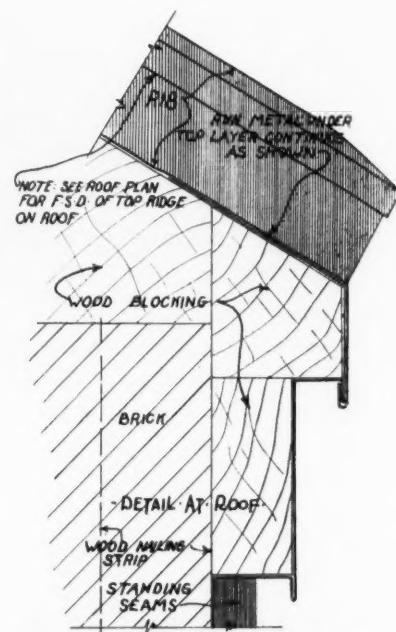


On some sections roof skylights are cut through the roof. This shows such a section

ing serves as water protection. All the stone cornices are covered with sheet lead. On cornices where there is more than 8 inches of projection the lead sheet is held down at in-

tervals by a washer and nail driven into wood plugs. This nail is covered with a small lead cap which is soldered all around the edge. The construction is shown in one of the details.

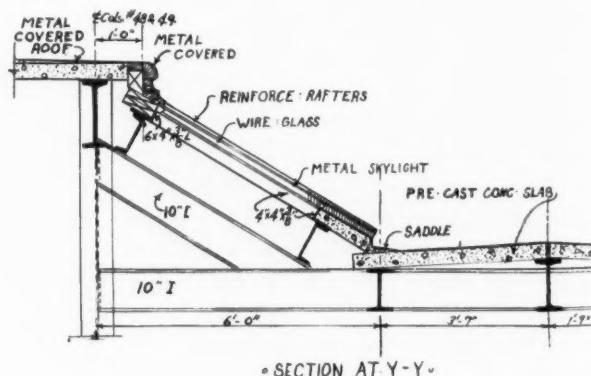
All the cornice lead is strengthened by a standing crimp placed a

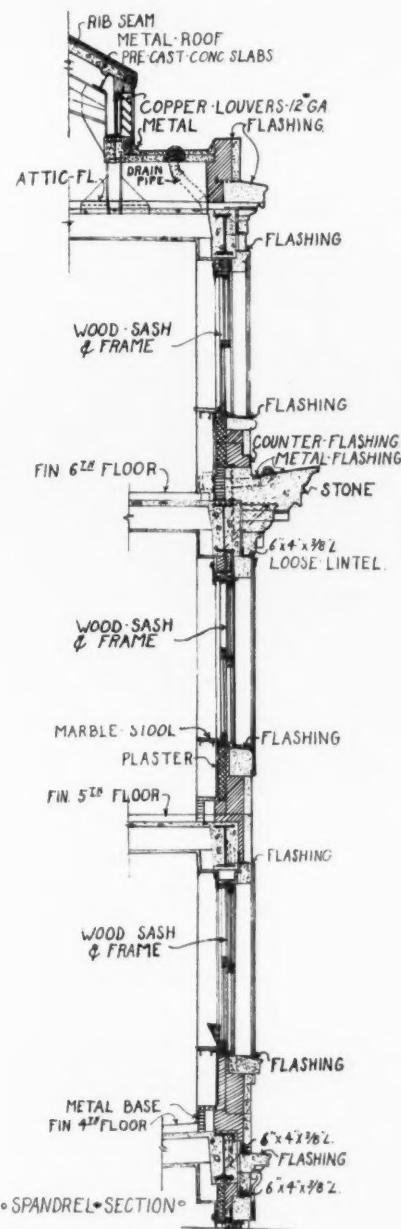


The eave cornice was fabricated like this. The top face sheet is also the bottom pan sheet. The lower face sheet is carried up and back over the roof. Two drips are used

few inches behind the outer face. This lead sheet of the cornice is brought out over the edge and turned into a pitched drip as shown. The back side of the lead is turned down into the gutter behind the stone.

All over the face of the building the mouldings and the projecting belt courses of stone are flashed over the top with lead sheets. In addition, the tops of the window lintels and the tops of the window



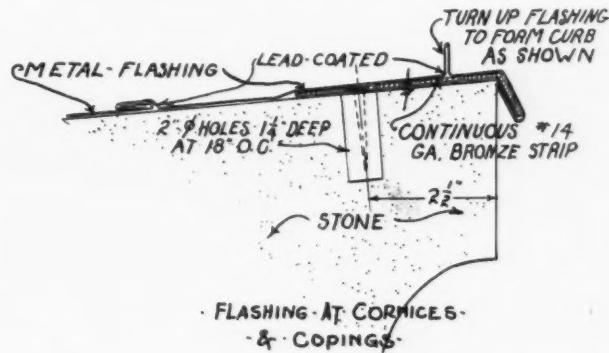


This detail shows the design of the lead cornice sheet. The bronze strip forms the mold for the lead sheet which is turned into a curb near the edge. The sheet is held by nails driven into plugs and capped

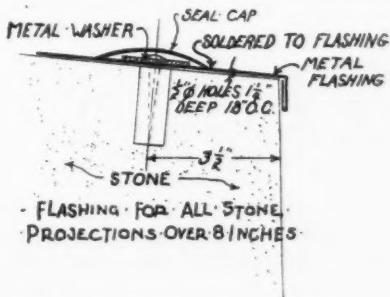
stone. These courses also conceal small gutters, inside drained, with the gutter lined and flashed with lead.

Some of the windows are ornamented with a lintel cornice having brackets. The top of all such lintels is covered with a continuous lead sheet brought out from behind the exterior stone course, over the lintel and turned into a drip at the

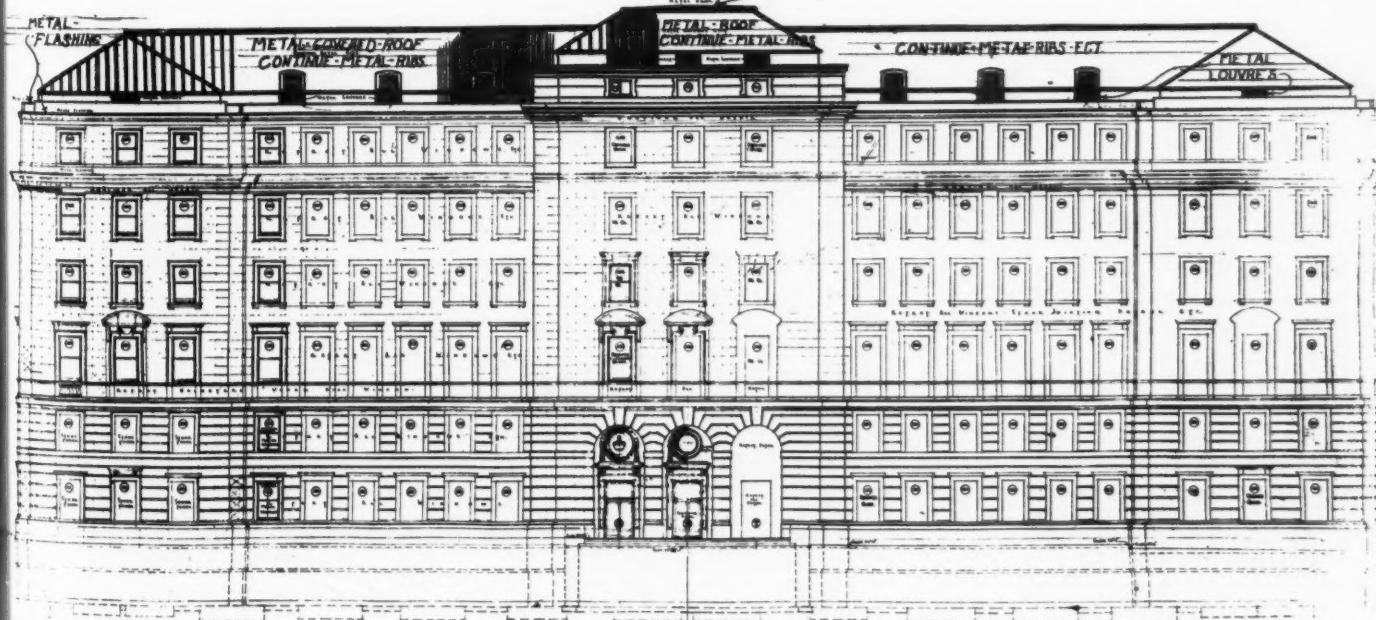
Much of the lead used on the building was cut into flashing and protecting sheets as shown on this detail. Note the use of lead at lintels, sills, cornices and moldings.



shop and delivered to the job. The workmanship on the metal contract as can be seen from the photographs is excellent.



Where the flashing sheet covers projections of more than 8 inches this construction was specified. Every attention to protection was the rule





Workmen are supplied with clean overalls and jackets for **EVERY** job. In addition, they are given strict instructions to be clean and careful. Owners appreciate this service

Advertising, Service, and Salesmanship Built This Practically 100% Repeat Cleaning Business

WE have been hearing and reading lately of the spreading evil of "buck passing" between the coal retailer and the warm air heating contractor. The furnace man puts the blame for poor operation on the coal, while the coal man, in turn, blames a poor furnace or a poor installation. The result is that the home owner does not know who is to blame and so welcomes with open arms the oil burner salesman or the gas furnace distributor.

Exactly this situation existed here in my home town of Ashville, N. C. However, substantial progress toward the solution of the trouble

By HENRY M. BROWN, Jr.

has been made by providing a service which is neither fuel nor heating, but a service which thoroughly analyzes the situation and recommends changes in either fuel, equipment, or both. The work deal primarily with coal and coal combustion. Obviously most of our leads come from the coal industry, but the heating man undoubtedly receives the most return from our work.

The home owner knows little about his furnace or his coal, so whenever something goes wrong

that he cannot see, such as broken pipes, fallen grates, etc., his natural inclination is to call the coal man and make a complaint that something is wrong with the coal. This of coarse brings the coal man into the picture. It is his product that demands service in the eyes of the consumer. Thus we find the coal man in the basement fighting for his product.

What the coal man usually finds is a dirty furnace, furnace pipe full of holes, cracked sections, or one of the many things which go wrong.

The coal man's first thought is to get the trouble fixed either by his organization or by a furnace man

or some service company. The coal man realizes that to-day to successfully defend his interests against gas, and oil he must offer a real service that will compete with that offered by the other fuels just mentioned.

In our work of servicing heating systems we have established a procedure which is here given for any progressive heating man to adopt or follow. Of course, some of the things we do, such as making an analysis of the coal, the heating man cannot do, but he can get it done or again co-operate with the fuel man who has access to such information.

Upon being called out to service a smoking or poorly heating furnace, a faulty flue or chimney, we make a careful examination before attempting to start work. As a rule the customer can easily be shown where the trouble lies, the remedying of which will rectify the poor results he is getting in trying to heat his home or his building.

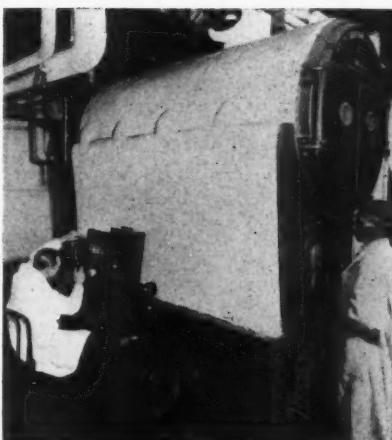
We have the necessary equipment, and well trained men to service the

furnace, flue, and chimney cleaning end of the business which is—if properly done—very profitable.

Our men start each job in clean overalls and jacket coats. They must be courteous and neat at all times or lose their job. When it is found that a cleaning is necessary, care is taken to see that dirt and dust are not spread to other parts of the house during the removal process by means of vacuum cleaner. We always leave a job in perfect condition, even to the extent of painting the furnace, and attending to other little clean up jobs which assuredly please the customer.

In a three month period we cleaned 275 furnaces and did not receive a single complaint.

And we do not forget all about a job once we have finished it. A personal letter is sent to the customer thanking him for his patronage, and in many cases special instructions are given which apply to the individual jobs. All this is most certainly appreciated as is evidenced by the fact that our repeat business is practically 100%, and also be-



Testing a large industrial boiler installation

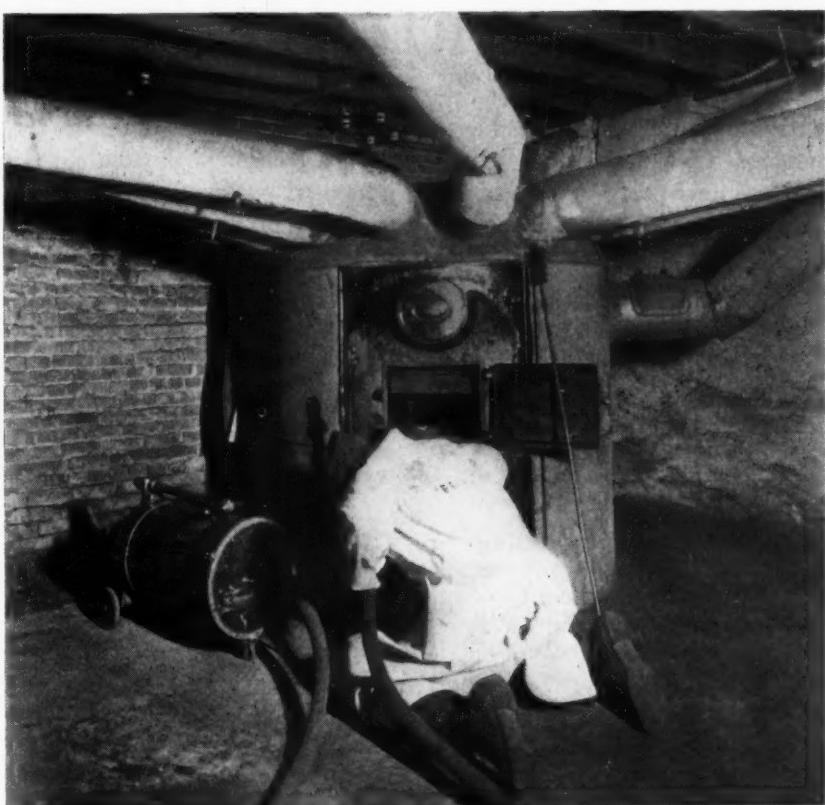
cause we find our customers boasting our service to their friends and relatives. Another important thing—our service is complete. We can make our own repairs whenever needed, and we don't have to tell our customer to "get a plumber" or do this or that. We do it right then and there with our own organization.

We have found it to our advantage to handle accessories such as regulators, various types of furnace cleaning brushes, water gauges, humidifiers, and other items which are so easy to sell where needed. Most important we push the sale of these accessories and find it easy to sell them when we have just finished a cleaning job.

Advertising plays a large part in the success of any enterprise. To state that it has helped our business is putting the case rather mildly. We have advertised extensively by direct mail, newspapers, magazines, and through the medium of the radio. All have produced the desired results.

Perhaps it will seem to the furnace man that, well here comes the coal man and the service company as my competitors. Not so in the least, providing the furnace man takes advantage of the opportunities offered by the coal man. The average coal man does not want to go in the heating business, or furnace business if he can help it. What he does want is some wide awake heating organization to han-

(Continued on page 28)



Cleaning methods have been worked out and tested to insure that the customer gets a 100 per cent good job. Only such methods insure repeat business



John Harrison, Jr., Says— “Tin Roofs Meet Every Requirement of COLOR, BEAUTY and SERVICE”

Tin roofing, or as it is technically known, “Terne Roofing,” has been used for generations with great success for roofing all types of buildings. Tin roofing has certain properties which make it an ideal material for standing and flat seam work. The light weight and extreme ductility, combined with great strength, are qualities which make for long life and absolute protection for buildings.

Architects have long recognized these qualities. With the awakened interest there is today in Colonial architecture, it is not at all difficult to gain their interest to the point of having a tin roof incorporated into the design of the building.

In Pittsburgh, a high class residential section has been laid out and called the Fox Chapel District. Building has been active in this district for several years and some of

Pittsburgh's leading architects have designed residences which are a credit to their profession. Many of these residences recently completed are of early American style. The residence of Robert K. Follansbee, well known to our industry, is a true Colonial. It was designed by R. Maurice Trimble, one of Pittsburgh's outstanding architects.

This residence was roofed by

One of the big selling points in favor of tin roofing is its beauty—especially when the tin is painted to match the color scheme of the house and its setting. The architect thinks in terms of color and the home owner is beginning to do so. Play up this color consciousness by talking about color.

John Harrison, Jr., of Sharpsburg, Pa., a suburb of Pittsburgh. Mr. Harrison has a number of fine tin roofing jobs to his credit both for old and new houses. Mr. Harrison enjoys an enviable reputation for quality work in the Pittsburgh district and he was complimented by the architect for the beautiful roof which he fabricated for the residence.

This house has been viewed with much interest by many people who have remarked upon its beauty and harmony of line and upon its excellent architecture. The roof is painted a beautiful green which harmonizes perfectly with the green and white colors of the house. Green and white is a perfect combination in a residence of this style and the standing seam tin roof is a prominent feature of the building.

The roof was fabricated of Fol-

Iansbee Forge Best Roofing 40 lb. IC Long Sheets. The sheets were 20 by 96 inches in dimension and the edges were turned up on the job and painted on the underside with oxide of iron paint. The courses were then laid side by side and the seams formed sheet to sheet in the standing seam style. Heavy rosin sized paper was laid over the roof sheathing boards before placing the roofing in position. Each sheet after laying was cleated down, cleats being 8 inches apart. The standing seams were double locked and were turned up $1\frac{1}{4}$ inches and $1\frac{1}{2}$ inches before turning and the seams were 1 inch high when completed. All valleys and gutters were laid flat lock seam the narrow way

and were joined to the standing seamed sheets by soldering on a folded seam. The courses of the sheets were joined at the roof comb with a flat seam which was double locked and soldered.

After the roof was laid, it was carefully painted with Spanish Oxide of Iron paint. After this paint was thoroughly dried, a second coat of Spanish Oxide of Iron paint was applied in a few days and after several weeks a third or green color coat was put on. Each coat of paint had time to thoroughly harden. This careful fabrication and painting of the roof will insure a long lasting job.

Mr. Harrison says it is easy to fabricate a good tin roof if Stand-

ard Practice is used and the metal worker is careful in forming the sheets and using plenty of solder and a heavy iron. When the seams are sweated in and not skimmed, a permanent tight seam is formed which will never tear apart.

No other type of roofing can show so many examples of long and satisfactory service as can tin. It is surprising how many architects are realizing the architectural fitness of this material. Mr. Harrison always carries with him, when talking about roofs with prospects, a book of photographs showing some of his finest work. He says that a good photograph saves much valuable time and much discussion for it is convincing beyond words.

AN INTERESTING Combination Finial and Ventilator

REPRODUCED here is an interesting copper finial which the Claremont Cornice Works of Los Angeles are installing atop the dome of the beautiful Mabel Shaw Music Auditorium, a memorial building at Claremont College, California.

The building has been designed by one of the country's foremost architects, Wm. Templeton Johnson of San Diego. He has been identified with some of the finest buildings in America, and it was he who was selected to design the United States Government buildings at the Iberian-American Exposition at Seville, Spain. He courteously ran the accompanying sketch on his drawing boards, specially for **AMERICAN ARTISAN**.

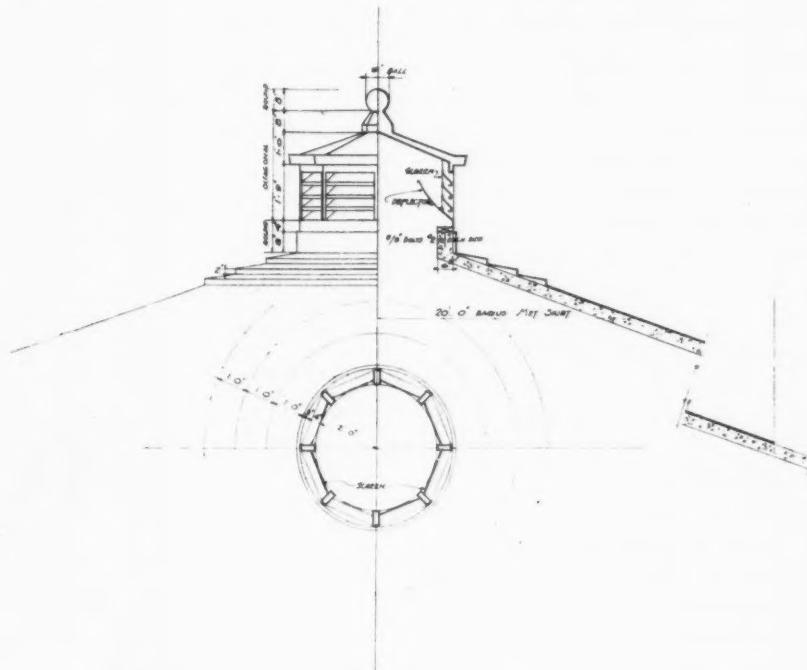
The unusually wide apron of this copper finial has been stepped off in an interesting number of offsets, protecting the concrete dome upon which it rests. And as long as the building stands the finial will be its crowning feature; its focal point.

It will furnish an everlasting example of the sheet-metal worker's art.

When asked why he selected copper to perform such an important

function, this internationally known architect replied:

"I used copper, as it was the best looking material for the purpose, aside from its enduring properties."



DETAIL OF VENTILATOR AT PEAK OF DOME.

MECHANICAL EXHAUST SYSTEMS IN PLANING MILLS

SHAVINGS and Sawdust Removal from Woodworking Machines Is a Lucrative Source of Business for Sheet Metal Contractors Who Familiarize Themselves with Refuse Handling Duct and Fan Systems

THE application of mechanical exhausters in planing mills, while one of the oldest classes of duct work, continues a profitable source of new business. About the time of the Civil War "blowers" began to be used for removing dust from shoe machinery and it was not much later that fan and duct systems came into general use for clearing the atmosphere surrounding woodworking machinery.

Modern, high speed woodworking machines produce larger quantities of sawdust, chips and shavings than formerly, thus making it even more imperative today to exhaust these positively and promptly before they circulate about the plant and interfere with milling operations in progress.

Any mechanical exhaust system to be satisfactory must remove both heavy and light material delivered by cutters, 26 grains per cubic foot being considered a fair load as dust goes. Hoods and piping should not obstruct the room, nor interfere with the movements of workmen.

The power requirement for driving the fans is expected to be held down to a minimum and, in cold climates, more air than need be would best not be exhausted, for much heat passes outward with such air.

There are two general types of installation, namely, the central and the group systems. In the former a single or double fan is located near the center of the shop with piping radiating to the several wood working machines. Group systems usually are preferred when ma-

By R. C. NASON

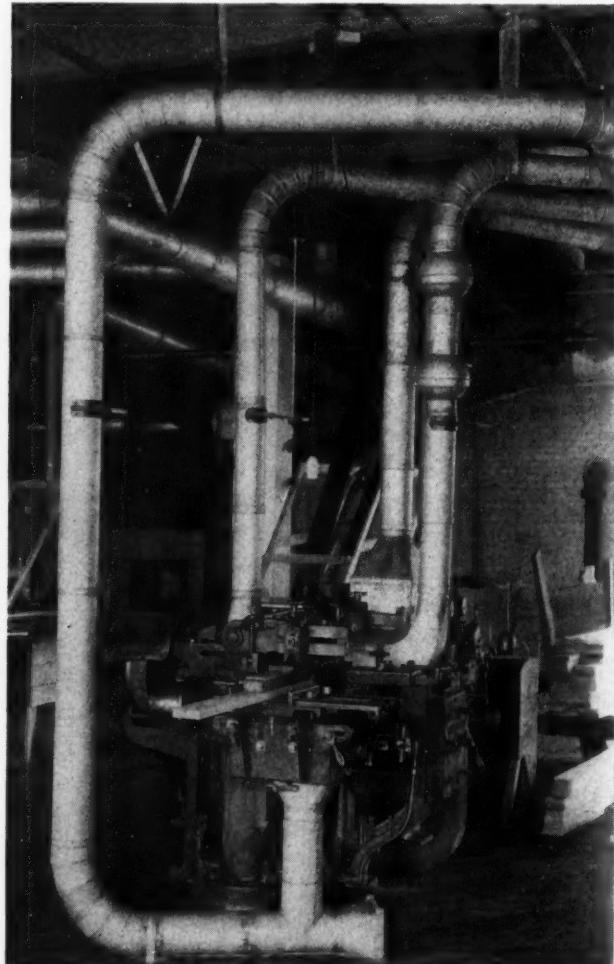
chines are widely scattered. In this case either the machines are served with individual exhausters or there are several small fans installed near different machine groups.

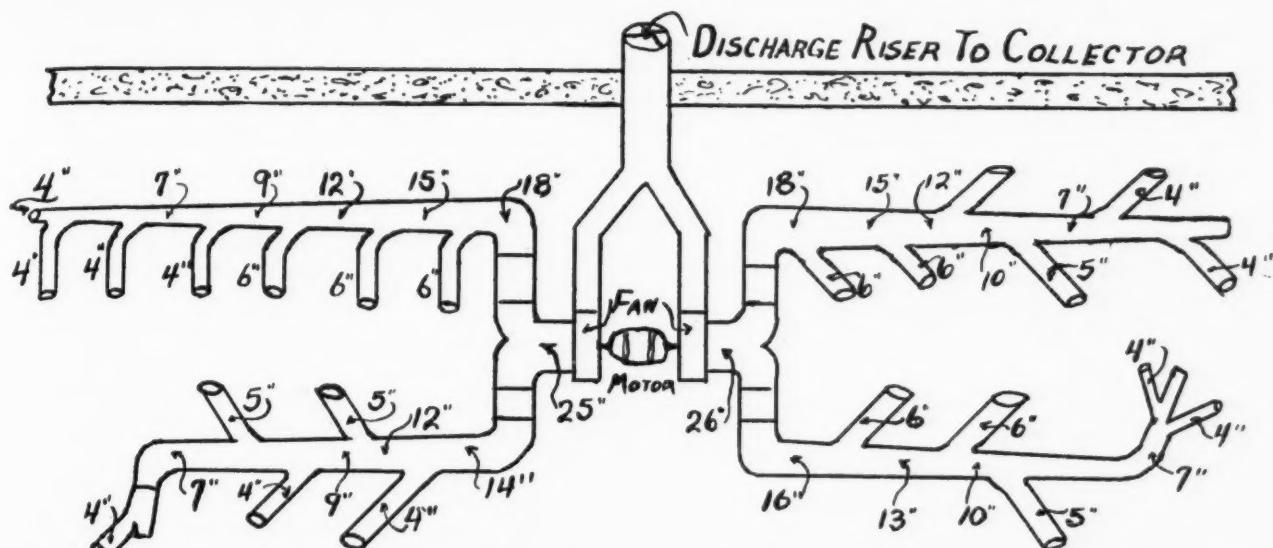
The larger pipes incidental to central systems result in lower friction and power loss per foot than is typical of group layouts and in the latter case balancing is more dif-

ficult of attainment. In localities or plants where power cost is low installation cost may be lower due to the use of small ducts, with high velocities, than when fans are of generous capacity, ducts large and power loss held at a minimum.

In designing exhaust systems for woodworking plants, contractors must know how many machines are to be served, their size and like data, for branch connections are plotted according to the sizes of machines,

As planing mill machinery becomes more complex and is faster to meet production demands, the need for positive removal of chips, shavings, dust, etc., becomes a vital problem. Blow pipe design is now a profession and the neatness and positiveness of their planing is evident. Here is an installation by a specialist





This is a simple collection system using four main collection lines with branches to individual machines. The diagram shows how the pipe is sized progressively back to the fan

the larger machines, naturally, requiring larger branch ducts and hoods. Some of the branch connection pipe sizes are offered in Table 1.

In addition to machine size and speed as factors that influence the selection of branch connections, it is advisable to learn the kind of lumber handled, whether this is wet or dry, cutter head patterns and like details, for heavy and damp wood chips are more difficult to handle than light, dry lumber.

The main ducts, necessarily of different diameters according to their loads, increase in size from dead ends toward fans, any point in the system being from 20 to 25 per cent greater in area than the sum of the areas of the branches entering between the point in question and the ends of the mains. Floor sweeps, if equipped with blast gates, are not included in determining this area.

Another method sometimes used in figuring mains is to size them so that velocity will range from 2,500 linear feet per minute to 5,000 feet per minute. Light shavings and sawdust from dry wood rarely require greater than 3,000 feet per minute velocity, heavy waste and sawdust from wet wood range from 3,000 to 4,000 linear feet per minute, whereas hog waste, pulp chips and like materials may require 5,000 feet per minute velocity. In select-

TABLE I
Sizes of Connections for Wood-Working Machinery

Type of Machines	No. of Connections	Diameter of Pipe
Swing Saws	Small size on dry kiln lumber, large on wet . . .	1 3½ inches to 6 inches
Rip Saws	Dry Kiln Material	1 4 inches
	Not Dry Kiln Material	1 4½ "
	Self-Feed Saws	1 5 "
Table Saws	. . . . .	1 4 "
	For Box Factory Work	1 4½ "
Mitre Saws	. . . . .	1 4 "
Variety Saws	" " with Dado Head	1 4 "
	" " with Dado Head	1 5 "
Double Saws	. . . . .	2 5 "
Gang Saw	(Dependent on size and number of saws)	6 inches to 9 inches
Band Saws		
	Blade under 2 inches wide	1 4 inches
	" 2 inches to 3 inches	1 5 "
	" 3 " 4 "	1 6 "
	" 4 " 6 "	1 7 "
	" 6 " 8 "	1 8 "
Jig Saws	. . . . .	1 4 "
Tenoning	Single Head	1 5 "
	Double Head	2 7 "
	Double End Double Head	4 10 "
Variety Moulder or Shaper	Single Head	1 4½ "
	Double Head	2 6 "
	Double Head, Heavy Work	2 8 "
Sanders		
	Belt — Less than 6 inches wide	1 4½ "
	" 6 to 8 and 10 inches wide	1 5 "
	" 12 and 14 inches	1 6 "
	Drum, 24 inches long	1 4 "
	" 30 "	1 5 "
	" 36 "	1 6 "
	" 48 "	1 8 "
	" Over 48 inches	1 10 "
	Disc 24 inches diameter	1 5 "
	" 26 inches to 36 inches	1 6 "
	" 36 " 48 "	1 7 "
Arm Sander	. . . . .	1 4 "
Planers, Matchers, Moulders, Stickers, Jointers, etc. (all top and bottom heads). Knives 6 inches to 8 inches		
	" 9 " 14 "	5 "
	" 15 " 20 "	6 "
	" 22 " 26 "	7 "
	" 28 " 36 "	8 "
Side Knives	Under 15 inches	4½ "
	16-20 inches	5 "
	21-24 "	6 "
Hog	12 inches wide and under	8 "
	Over 12 inches	12 "
	One Hood for Each Cutter	

This table gives in brief form the pipe sizes ordinarily used for collecting common materials. The table is arranged by machine and also shows the number of connections each machine should have

ing main air speeds it is suggested that these be kept as low as possible without sacrificing rapid removal of refuse, so that the power requirement may be kept low.

Thus in the typical planing mill exhaust system shown in Figure 1 the end of the main, extreme left, is 4 inches, or the size of the branch. This main size is increased to 31.4 square inches, or 7 inches diameter at the next connection, this being equivalent to twice 4 inches diameter, plus 25 per cent.

The main size increases progressively until the fan inlet is reached at which point the main enters the exhauster inlet as 25 inches diameter, left and 26 inches, right.

Now, having covered the suction end of the system briefly the practical designer studies the delivery side of his problem. He has learned from experience that the discharge pipe leading from the fan usually is made the same diameter as the main suction pipe. Between the fan and the separator—cyclone type—there is no diminution of the pipe area, elbows are eliminated as much as possible.

In selecting a collector it is well to recall that large sizes offer less obstruction to air and material flow, hence are economical on power. When the velocity of refuse laden air passing through a collector is lowered a larger portion of the material held in suspension is separated than if passed at high pressure through a small collector.

If a separator of common design is to be used it is the usual plan to select one whose nominal size is equal to the diameter of the pipe connected to it. Angle iron frame supports with internal stay rods with take-ups are the general rule

TABLE II

FORMULA AND TABLE FOR COMPUTING EXHAUST SYSTEMS FOR WOOD WORKING PLANTS

Cubic feet of air handled per minute through average collecting hoods. Based on coefficient at orifice of .71 with 10% added for leakage.

Diameter of Connection Maintained Suction—Inches Water Gauge	1	1½	2	2½	3	4	5
Pipe Inches	1	1½	2	2½	3	4	5
1½	38	47	54	61	67	76	86
2	68	84	97	108	118	136	163
2½	107	131	161	168	185	214	238
3	153	188	217	243	266	306	343
3½	209	256	296	330	362	418	466
4	273	334	386	431	473	546	609
4½	345	423	488	546	598	690	775
5	427	523	605	676	741	854	955
6	614	751	867	970	1062	1288	1373
7	885	1023	1181	1322	1448	1670	1870
8	1092	1337	1546	1727	1892	2184	2440
9	1381	1694	1953	2184	2387	2762	3091
10	1705	2090	2409	2695	2959	3410	3806

COLLECTOR RESISTANCE

$$R = C \left(\frac{V}{1000} \right)^2$$

R = The Collector resistance in inches of water.
 V = Air velocity in feet per minute at collector inlet.
 C = Is a constant whose value depends upon the type and construction of the collector and usually ranges from .1 to .2.

for proper bracing. In localities where atmospheric wind pressures are strong and when collectors are placed several stories above ground stronger than ordinary supports such as guy wires are necessary.

In cyclone collectors the air and shavings enter at a tangent and the whirling motion, setting up a centrifugal action, casts the suspended dust and materials against the sides of the collector, there to slide down the central delivery pipe into bins or, in many cases, into fireboxes of boilers where the material makes admirable fuel.

Light dust generally is more difficult to separate than shavings and chips. Whereas a good cyclone collector will separate some 95 percent of the suspended material gathered from woodworking machinery, if the dust is all fine, as, for example, talcum, its collection may be found difficult without the aid of cloth receptacles, water pans or other devices specially constructed for the purpose.

Collectors sometimes are arranged in parallel, this arrangement often being recommended for capturing fine dust. The first collector then removes the bulk of the material, the next one a smaller portion and so on. It is not uncommon, also, to use two collectors of the centrifugal or cyclone pattern with separate ducts into them. If ducts are provided with switch gates separation may be had in either or any of the collectors as desired.

Although no hard and fast rule can be outlined for computing the resistance in inches water gauge encountered in passing material laden air through cyclone separators the accompanying formula and Table 2 will prove useful in rough estimating of sizes. Let it be said that recent separator designs now are available that offer but slight friction loss. The data afforded here are typical of average practice only.

Reduction in the current new building rate need prove no impediment to sheet metal contractors in soliciting new fan and duct systems work. In addition to plenty of remodeling due to shifting of machinery, new planing mill machines constantly are being added, duct joints spring apart and admit air leaks, accidents to piping frequently occur.

Atop the roof the weather plays havoc with exposed metal, collectors become leaky and stopped up, weakened supports throw collectors out of plumb and, all in all, there is considerable sheet metal work of a profitable and satisfactory sort in connection with what is commonly known as blow-pipe work. Many contractors devote their entire attention to this branch of the sheet metal business.

A 100% Cleaning Business

(Continued from page 23)

idle the service calls that originate with the coal dealer. This is a new field and if developed will prove very profitable if the furnace man will only go and have a heart to heart talk with the coal dealer. Un-

doubtedly they can both help save their markets from certain competitors and do so at a profit.

In view of all the worn out, broken down heating units which are attempting to function through-

out the length and breadth of the country, there does seem to be a bright future ahead for the furnace man who views this situation in a comprehensive manner, and is aggressive enough to go after work.

FAN BLAST ENGINEERING

By PLATTE OVERTON
Heating Engineer

THE writer is frequently asked the question—"What velocity do you recommend in mains, branches and risers for air conditioning systems in residences?"

Undoubtedly this question has come up because contractors want to use smaller ducts and because they are beginning to understand that the low velocities we first used are not in keeping with the velocities established as standard in larger types of fan blast work.

The velocity in the mains, branches and risers depends largely on the amount of air passed through the duct. The larger the duct, the higher the allowable velocity.

Where upwards of 2,500 cubic feet per minute of air is passed through a duct velocities from 800 to 1,000 feet per minute are not too high. Above 4,000 c.f.m. velocities up to 1,200 feet per minute may be used.

The writer believes that all trunk ducts should be designed to equal resistance per running foot and the only velocity that can be calculated before the system is designed is that in the main where it leaves the heater or plenum chamber.

The accompanying plan is a good example of a trunk duct designed to equal friction per lineal foot. Let us dissect this trunk duct and see what the velocities will be. This duct serves 13 warm air inlets with a total of 1,372 cubic feet per minute.

Rectangular ducts are used, but in designing the duct to equal friction per running foot, the calculations are made on round ducts and then changed to equivalent rectangular ducts for equal friction. Hence, if we estimate a velocity in the main of 1,000 feet per minute, 1,372 divided by 1,000 equals 1.372

square feet of duct or round duct 16½ inches in diameter.

It will be noted on the plan that we started off the heating chamber with a duct 30x8 inches. One rectangular duct 30x8 inches is equivalent to a round duct 16½ inches in diameter for equal friction.

Now we note that a duct 30x8 inches equals $\frac{30 \times 8}{144}$ equals 1.66

square feet and 1,372 divided by 1.66 equals 830 our velocity. From this it will be seen that our velocity dropped, but our friction, of course, remains constant.

Hence, it might be said that we design our trunk to resistance per lineal foot and let the velocities go where they may.

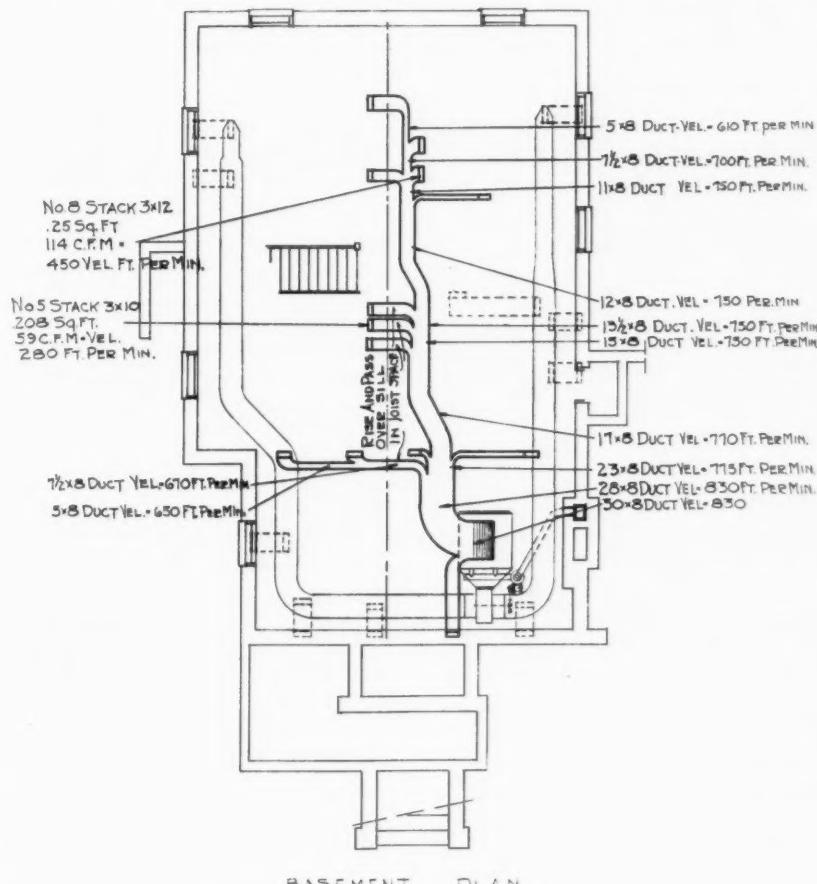
It is interesting to note the velocities in the length of the duct. They drop sharply at some points and hold fairly even through several changes of duct size.

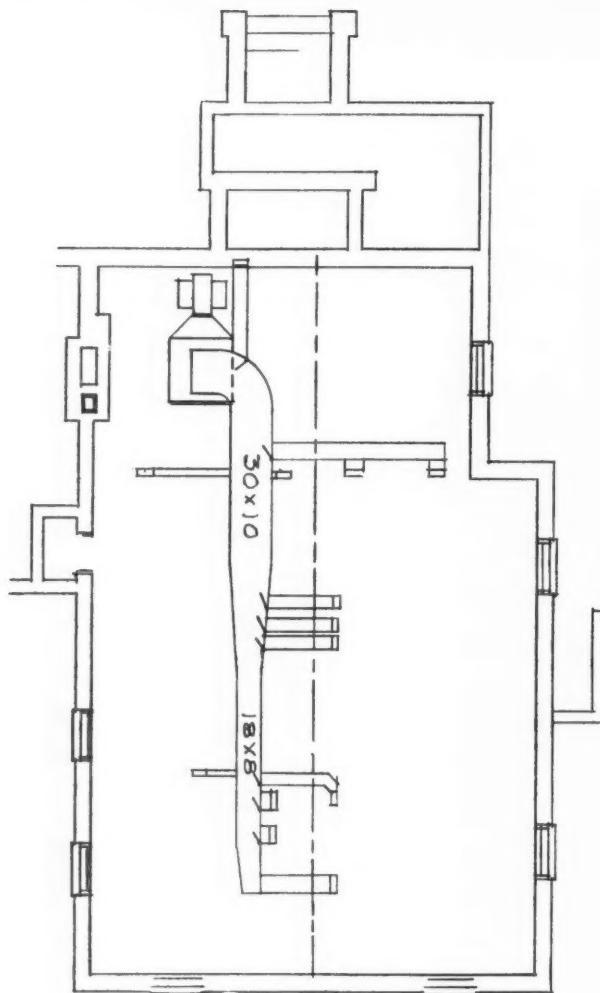
Note that in the branch close to the heater the 7½x8 and 5x8 ducts do not have the same velocities as the two same sized ducts on the far end of the trunk.

A glance at the plan and we might say that we have designed the main to a velocity of 750 feet per minute, the branches to 650 and the risers to 450 feet per minute. This is "roughly speaking."

Why not design the main accurately and be sure?

The method is simple. No volume dampers are required, but they





There is no denying that the public's interest in "air conditioning" is going to compel heating contractors to learn enough engineering so that the systems they install will be correct within engineering limitations. "Hit or miss" design will retard progress and create new sales outlets. Designs such as this may look all right but no heating engineer would claim ownership. "Why not," says Overton, "design every system so that it functions without dampers, splitters, baffles, etc. It is just as easy to do it right as to do it wrong"

may be installed if desired. When 1,372 feet of air is forced into this main every air inlet will get its quota of air within 2 per cent of that desired. The c.f.m. required is taken from the data sheet and is fixed by the B.t.u. loss of the room served.

The second plan might be labeled—"How not to design a trunk duct."

Supply risers may be designed the same size or larger than the supply branch.

When all inlets are 6 foot or more above the floor line the gravity supply (when fan is idle) will be about 75 per cent of the mechanical supply. In mild weather the fan will operate infrequently due to the gravity supply. This gravity supply is generally higher in temperature than the mechanical supply.

This proves that there is a natural air flow or draft in the risers and if they are the same size or larger than the supply branch no resistance need be considered for them.

Africa Finds New Uses for Copper

WHEN the Governor of Arizona recently inaugurated a Copper Week to promote the use of more copper, the ensuing publicity brought forth an interesting letter from a lady living in South Carolina.

This letter was addressed to the *Arizona Republic*. And that newspaper gave the letter prominence under the caption "Uses for copper," besides commenting editorially upon the points their lady correspondent raised.

Her letter follows:

"Editor, *Arizona Republic*.

"Sir:

"I heard recently from South Africa of a house in which the door handles, plates and the fixtures and

brackets were of copper, and looked mighty fine. That there were great bowls shaped like oriental water pots filled with flowers, and these copper bowls, burnished brightly, were extraordinarily lovely. Some were in shape like Grecian vases ornamented with a tracery of silver inlay.

"Since hearing of them I have written to three department stores, and several gift shops which keep all kinds of vases and flower bowls, and cannot find anything in copper. Surely with copper mines in America we should not have to send out abroad to get articles like this. Why does not America think out new ways of using copper like England does? I do not know what copper fixtures look like, but I can imagine

that copper bowls and vases for flowers would be charming.

"We seem to be using copper less and less.

"In my youth we never dreamed of making jam and preserves in anything but a copper kettle or boilers. Nowadays we cannot get copper utensils, and the preserves are not so good. I do not know why copper should not be used more for ornament, it needs only some one to introduce it. It would be something new, and I am sure that many like myself would be glad to buy these new bowls and vases if they were on the market.

(Signed) "Elsa Wade Handley."

We hope that readers of AMERICAN ARTISAN will find a thought here which they can turn into cash.

NEW ITEMS and NEWS ITEMS

From and about the Manufacturers and Jobbers

Macfie Appointed Assistant Sales Manager Revere Copper

Donald Dallas, president of Revere Copper and Brass Incorporated, has announced the appointment of C. A. Macfie as assistant sales manager of the company, with headquarters in the general sales department, 230 Park avenue, New York City.

Mr. Macfie has been in the copper and brass business since 1912, starting with the U. T. Hungerford Brass and Copper Company.

Later he became connected with the Rome Brass and Copper Company, now known as the Rome Division of Revere Copper and Brass Incorporated, and was in charge of all sales to distributors in New York City and the Metropolitan area.

Since the Revere consolidation, he has been manager of merchandise sales in the New York district.

Furnace Blower Manufacturers Hold Meeting

Most of the manufacturers of furnace blowers gathered June 30 in Chicago to formulate plans for the organization of an association which will undoubtedly be of benefit to the entire warm air heating industry.

I. W. Rowell, manager of the Lakeside Company, Hermansville, Mich., was appointed chairman of a committee to formulate and present two new heating codes. The first code will govern the testing and rating of furnace fans and blowers.

The second will seek to establish some uniform basis for calculating a forced or mechanical heating system. A number of men who have had extensive experience in forced air heating have been asked to serve on this second committee. A huge amount of work will have to be done, but the committee hopes that through getting the active support of all members of the industry definite and progressive ideas can be prepared for the next meeting in September.

E. H. Skinner to Be Agricola Representative

E. H. Skinner, well known to the furnace trade in the Central States, is now representing the Agricola Furnace Company in northern Indiana and sections of Ohio and Michigan.

New Moncrief Catalogue Ready for Dealers

The Henry Furnace and Foundry Company, 3471 East 49th street, Cleveland, has ready for distribution a new and enlarged catalogue showing the company's line of furnaces, boilers, blowers, registers, grilles and pipe fittings.

The catalogue is attractively bound in a bright red cover and color is used throughout the booklet.

Complete information on each of the products shown is given with the illustrations.

Interested readers may get a copy by addressing a request to the company.

Frederick Strahlendorf Drowned July 22nd

Frederick Strahlendorf, 15 years old, son of Mr. and Mrs. John R. Strahlendorf, 3927 Cornelius avenue, Indianapolis, drowned July 22, in Webster lake, Indiana, when the outboard motor boat in which he was riding overturned in midlake. He was alone.

John R. Strahlendorf, father of Frederick Strahlendorf, is a salesman for the Peerless Foundry Company in Indianapolis.

W. E. Lamneck Co. Adds Many New Farm Products

The W. E. Lamneck Co., Columbus, Ohio, manufacturers of furnace equipment, laundry dryers and other sheet metal products, have added a long list of new products to the company's line greatly diversifying the company business, it was announced recently by W. E. Lamneck, president of the company.

This announcement also discloses that Martin B. Armstrong, vice-president of the Lamneck Co., has resigned as president of the Thomas & Armstrong Co. of London to devote more time to the manufacture of the new products being added by the Columbus firm. Mr. Armstrong will assume charge of the selling of the new products with the Lamneck Co.

The new line of products include a complete line of sheet metal farm equipment, including silos, silo roofs, metal buildings, metal garages, metal corn cribs, grain bins, livestock tanks,

chicken brooders and a number of other articles.

In addition to the new line a new product—garbage vaults—which set in the ground and are operated by the foot has been added to the company's line this year.

Some of the new products are already in production at the Lamneck plant and deliveries are now being made to distributors and consumers. The complete line of products, including the new ones, will be displayed at an exhibit of the company at the coming state fair here and at fairs in Indiana and Louisville.

Hart and Cooley Making New Line of Forced Air Registers

The Hart and Cooley Manufacturing Company, Chicago, Ill., are now mailing a new circular describing the company's new line of forced air registers. These registers have been designed especially for forced air heating and are said to be the first complete line of forced air registers placed on the market.

The line includes both sidewall and baseboard registers, each type with one-piece and removable faced types. The circular contains complete descriptions of all units. Each unit is illustrated. In addition installation details are shown and discussed.

List prices with complete descriptions, sizes and catalogue numbers are tabulated.

Of great value to contractors is the tabulation at the end of the circular. These tables give the number of cubic feet of air per minute delivered through each type at velocities from 200 to 800 feet per minute.

Circulars will be mailed to anyone writing for a copy to the company's office at 61 West Kinzie Street, Chicago.

L. S. Hamaker Promoted By Republic Steel

L. S. Hamaker, advertising manager of Republic Steel Corporation, becomes manager of sales promotion, effective August 1, according to an announcement by N. J. Clarke, vice president in charge of sales. Mr. Hamaker will assume his new duties immediately, making his headquarters at Youngstown.

Yoder Company Appoints Regional Representatives

The Yoder Company, machinery builders, Cleveland, Ohio, announce that Wm. Wulf Company, 850 Maccabees Building, Detroit, Michigan, will henceforth act as sales representative for the company in the territory of Detroit and vicinity.

Also the Harry G. Masten Company, 5229 Kimball Avenue, Chicago, has been appointed to act as sales representative in Chicago and vicinity.

The company states that these appointments have been made in order to facilitate handling of orders and inquiries. All inquiries from these territories should be sent to these district offices.

New Book on Modern Combustion

"Modern Combustion, Coal Economics, Fuel Fallacies," is the title of a new textbook on the latest developments in fuels and their combustion by Clarence V. Beck, a well-known authority. The 28 chapters in this book discuss coal economics, combustion,

efficiency, stokers, etc. The volume is \$3.00, postpaid, and is published by the Mid-West Coal Retailer, Chicago.

Gard Smith to Manage Premier Indiana Territory

Gard V. Smith, who has been associated with the Globe American Corporation of Kokomo, Ind., has been placed in charge of Indiana territory sales for the Premier line, with headquarters at Huntington, Ind., according to an announcement just made by the Premier Warm Air Heater Company of Dowagiac, Mich.

For some years Gard was manager of the furnace division of the Detroit Stove Works and has many acquaintances in the trade.

B. F. Sturtevant Personnel Changes

The B. F. Sturtevant Company of Hyde Park, Boston, Mass., announce the following changes in personnel:

Walter L. Hunken has been appointed

manager of the Greensboro, North Carolina, office.

Philip Cohen has been appointed acting manager of the Cleveland office.

E. A. Engdahl has been appointed manager of the Seattle office.

Wayne Oil Burner Co. Making New Home Units

The Wayne Oil Burner Company, Fort Wayne, Indiana, successor to the Wayne Home Equipment Company, is now ready to distribute their new deluxe oil burner and their new Gasoroil burner.

In addition to established design a new firing head, self priming cup and added beauty are incorporated.

The Gasoroil burner is designed to meet the lowest priced unit. The burner will be marketed as a packaged proposition. The burner will sell at \$80 to the consumer. The burner comes equipped with all the necessary piping, fittings, etc., to make a complete installation.

Complete information is contained in a folder which can be had on request

ASSOCIATION ACTIVITIES

Indianapolis Picnic Proves Tinnery Can Still Eat and Play

The Sheet Metal Picnic sponsored by the Indianapolis Association went over in great shape with an attendance of approximately two hundred. The largest outside delegation was four carloads from Louisville headed by J. M. Holstner, president of the Louisville Association, ably seconded by J. E. Merrick, past president of the National. Two carloads from Terre Haute, led by Frank E. Anderson, and one carload from Orleans, led by Otis Burton, helped swell the contractor attendance.

The long distance championship was garnered by Fred Heads, who came "clean" from Chicago, which is considered quite an accomplishment.

During the forenoon the guests resumed diplomatic relations after a year of competitive warfare. There seemed to be no difficulty in the accomplishment of the objective. Also a certain amount of unofficial baseball was played preparatory for the real tussle later in the day.

At around 1:00 o'clock a 100-foot

table was arranged under which the various guests parked their respective feet. Baskets were emptied of an astounding assortment of edibles, of which an unreasonable proportion was consumed in conjunction with coffee personally served by the picnic chairman, Elmer Mullin. Perhaps the feature of the dinner was a cake, provided by Mrs. A. Arnold, covered with white frosting and carrying in red the complete emblem of the Indianapolis Sheet Metal Contractors Association. The cake was dubbed the wedding cake, possible because Mr. and Mrs. Arnold are married a year or more. The cake was quartered and re-quartered until there was a fair sized piece for every guest.

The afternoon activities took on the aspect of a three-ring circus with Al Selvig and his baseball game competing with Homer Selch with his 100 Yard Hoppers and Fred Wilkening with his Horseshoe Hounds, for the attention of the spectators.

The baseball game was won by Deacon Waters' Tinnery, who vanquished the flower of the Furmet team, largely due to the artistic rooting of the "Deacon" himself. Intensive investigation failed

to disclose the captaincy of the Furmet team, although a measure of evidence points toward Harry Jones as the guilty party. The score was very close. The actual figures are not available due to the adding machine breaking down, but the consensus of opinion of all three of the umpires is that the Tinnery won.

Homer Selch with his Balloon Busters et al, held the attention of the guests during the afternoon. Prizes were won by all and sundry.

The horseshoe committee has not yet reported, but it was whispered around that champion Fred Wilkening had been dethroned. It is known that Harry Beaman was seen prowling around in that vicinity at perhaps the crucial moment.

President Holstner of Louisville invited the Indianapolis Association to send a good representation to the Louisville picnic on August 9. President Beaman issued a special invitation to the guests to attend the Muncie District Meeting on August 28.

In the interim between activities, pop was consumed by the ton, ice cream by the bushel and bananas by the barrel. A good time was had by all.



Here is the Brundage Twin Air Washer mounted on a Brundage Twin Blower. No additional floor space used. Returns enter at top.

A Fitting Partner for the Brundage "Twin" Blower

The Brundage TWIN AIR WASHER

**"It Washes" — "It Purifies" — "It Humidifies"
— "It Cools in the Summer"**

Air conditioning is the science of controlling temperature, humidity and cleanliness of the air within and over a specific area.

Such products as the Brundage Twin Blower and the New Brundage Twin Air Washer make Air Conditioning scientifically possible.

Let us tell you all about the New Brundage Twin Air Washer, a fitting companion to the Brundage Twin Blower. Write today.

The BRUNDAGE COMPANY
KALAMAZOO, MICHIGAN

CHICAGO STEEL BENDING BRAKES AND FORMING PRESSES

The perfected result of over 30 years experience in the manufacture of sheet metal bending machines. Over 25,000 machines in use.



POWER BRAKE

- Hand Brakes
- Cornice Brakes
- Power Brakes
- Box and Pan Brakes
- Forming Presses
- Special Brakes and Presses



FORMING PRESS

The most complete and up-to-date line of sheet and plate bending and forming machines in the world. Lengths, 3 to 16 feet, with capacity to bend from the lightest metals up to $\frac{3}{16}$ in. plate, cold.

DREIS & KRUMP MANUFACTURING CO.
7404 Loomis Street • Chicago

Mention AMERICAN ARTISAN in your reply—Thank you!

PEXTO Under Driver POWER SQUARING SHEARS

No. U136—Capacity 16 Gauge Soft Steel and Lighter



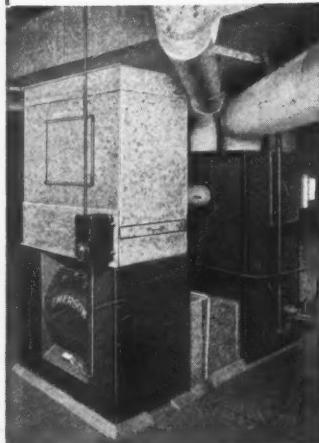
A list of the users of Pexto Power Squaring Shears reads like a page from the Blue Book of American Industry. For years manufacturers have looked to Pexto for equipment of this character. Exclusive features of design and construction, plus rugged, built-in quality have established Pexto's unquestioned leadership in this field. Wherever there's a squaring shear job to be done, there's a size and type of Pexto machine to do it best. Send for Bulletin A10.



THE PECK, STOW & WILCOX CO.

SOUTHBURY, CONN.

Easier Sales and Better Furnace Operation



Typical Installation

The EMERSON ELECTRIC MFG. Co.
2018 Washington Ave., St. Louis, Mo.

- Send Furnace Blower circular and jobber's name.
- I am interested in distributor's franchise.

Name.....

Address.....

DON'T wait another day to get the whole story about this amazing new Furnace Blower. It is self-contained. Eight speeds are available to adjust capacity from 955 to 2540 cubic feet per minute—one unit takes care of 90% of your installations. It is made by the manufacturers of Emerson Fans and Motors. 40 years' experience in fan design and motor building assure unusual dependability and excellent performance. Write for full information today—how this new Furnace Blower makes easier sales and guarantees better furnace operation.

Some attractive territories still open for distributors.

USE COUPON • • •

EMERSON
FURNACE BLOWER

No special wiring.

Operates from lighting circuit.

Quiet operation.

Direct drive.

No pulleys or belts.

Motor spoke mounted in rubber.

No brushes or starting devices.

No radio interference.

Made by the makers of
EMERSON FANS
FURNACE FANS
AND MOTORS

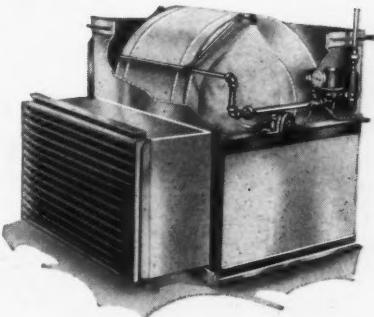
Say you saw it in AMERICAN ARTISAN—Thank you!

A
Good Line to Sell . . .

MIDLAND

THE MIDLAND FURNACE CO.
COLUMBUS | DESMOINES
O H I O | I O W A

Washer-Blower for Homes Now in a Single Unit



—and at a
One-Unit Price

NO competition for dealers handling this new Am-Pe-Co Air Washer-Blower Combination. Homeowners get *both* washed and humidified air at *one-unit* cost. You get greater profits and extra sales.

Undersells all types of ordinary double installations. Its compactness saves space and makes for a better job. Also operates as a summer cooling plant if desired.

Latest scientific design, exclusive features, *guaranteed ratings* and finest workmanship throughout. Let us send you all the facts. Write at once for new illustrated circular and dealer prices. Be the first in your locality to cash in on Am-Pe-Co Air Washer-Blower.

*Also Am-Pe-Co Blowers for
forced air systems only*

American Machine Products Co.
Box B, Marshalltown, Iowa



GAS-FIRED VENTED



FLOOR FURNACE

Here is a low-priced, fast selling leader which not only pays you a handsome *first* profit but enables you to keep that profit! After service calls are practically *nil* ... The Payne Furnace Franchise is a real asset. In these days of bitter competition and swiftly changing trends, it pays to line up with the leader. In the gas heating field, no other line compares with Payne—an outstanding success for fifteen years. Here is a real opportunity. Write for proposition.



PAYNE FURNACE & SUPPLY CO., INC.
Beverly Hills, California

Warehouse—Buffalo, N. Y. • Jobbing Connections in Principal Cities
Dealers Everywhere

There's a Payne Heat System for Every Climate and Building

Dr. E. VERNON HILL Tests FURBLO



*The
Quiet Efficient
Furnace Blower*

Pioneer and Leading Aerologist, Editor of the Aerologist, Makes Exhaustive Laboratory Tests of FURBLO and says—

"The Lakeside Company, I believe, has taken the proper attitude before the industry in having its furnace blower carefully and accurately tested by a disinterested authority. The purchaser is thereby assured that the performance data is not prejudiced or exaggerated."

**FURBLO Does What We Say It Will—
Performance Data Is GUARANTEED**

LAKESIDE CO., Hermansville, Michigan
MAKERS OF LAKESIDE VENTILATING SYSTEMS

WHITNEY Lever PUNCHES TIME SAVERS AND MONEY MAKERS IN ANY SHOP

NO. 1—HEAVY DUTY PUNCH

The punch for tough work.
Length 34 in.
Weight 2.2 pounds.
Capacity $\frac{3}{8}$ inch hole through $\frac{1}{4}$ inch iron.
Heavily reinforced for strains. Punches and dies $\frac{3}{8}$ to $9/16$ by $1/64$ inch. Insertable pipe handles.

NO. 2 PUNCH—A Leader for Over 20 Years

The punch that made the Whitney line famous. Preferred by thousands of men for accurate and quick punching. Depth of throat, $1\frac{11}{16}$ inches. Capacity $5/16$ inch through $\frac{1}{4}$ inch iron. Extra punches and dies, $3/32$ to $\frac{1}{2}$ inch by $1/64$ inch.

WRITE FOR CATALOG

W. A. WHITNEY MFG. CO.
636 RACE STREET

Rockford
Ill.

**OVER
5000**

Lansing Dailaire System

Makes Perfect Weather and Dealer Profits

Washed Air, Humidified Air, Forced Air, Heated Air and Summer Cooling in One Casing



MR. DEALER—

If you want the furnace business that will show you a profit, get in step with progress—Line up with the Lansing Dailaire System—The System that is more than a furnace, and the one that captures the heat units.

Write for complete proposition at once.

Showing Washer on Side

DAIL STEEL PRODUCTS CO.
6050 Main Street

Lansing, Mich.

A 2 Purpose Unit for cooling or for heating

Today a furnace line is not complete without at least one unit which will give air conditioning.

The Public is demanding not a number of units that will cool and heat as well, but now they must have a single unit which will do this work—cool in the summer and heat in the winter.

It can be done.

AKRON AIR BLAST FURNACE

Let us tell you about the Akron Air Blast—the single unit which gives "Air Conditioning." Of course, the May-Fiebeger line is complete, giving a dealer complete range of prices and sizes to meet any conditions.

Write today for the details



The tremendous success of SILENTAIR AIR CONDITIONING UNITS results, in no small measure, from the fact that they are MATCHED UNITS. Easily installed with any warm air furnace they bring splendid profit to dealers and comfort and economy to home owners. Write for descriptive literature.

A. GEHRI & CO., INC.

Factory & Main Office - - - Tacoma, Washington
Eastern Sales Office & Warehouse, Baltimore Trust Bldg., Baltimore

The May-Fiebeger Co.
NEWARK
OHIO

Vernois

**Correctly Designed
Sturdy in Construction
Efficient in Operation**



We particularly call your attention to the one piece radiator, the heavy combustion chamber, the ball bearing grate, the heavy deep cupped firepots, the upright lever shaker handle. These are a few of the important Vernois features and show you why it pays to sell the Vernois—"a better furnace."



**VERNOIS
GAS RANGES**
Distinctively Different
A Complete Line

**VERNOIS
ENAMELED
CIRCULATING
HEATERS**
For Coal—Gas and
Wood
Are Ready Sellers



Mt. Vernon Furnace & Mfg. Co.
Mt. Vernon, Ill.

Say you saw it in AMERICAN ARTISAN—Thank you!



"True to the Name"
FAULTLESS
WARM AIR FURNACES

**THE
GRAFF
FURNACE
CO.**
Scranton, Pa.

New York City
Sales Office:
116 Wooster St.

The present lively selling of Faultless Furnaces is indicative of their supremacy. We invite inquiries from new dealers, interested in taking part in the Faultless Furnace sales boom!

MARSHALLTOWN



SHEARS



No. 18

SPECIFICATIONS

CAPACITY—
18 gauge and lighter — 1 $\frac{3}{4}$ " radius.

CUTTERS—
2" x 1 $\frac{1}{2}$ "—high grade tool steel.
Slightly knurled to feed material.

ADJUSTMENT—
One bolt. Instructions furnished.

SIZE AND MATERIAL—
Height 19 $\frac{1}{4}$ "; head cast iron;
base cast iron; gears steel and
cast iron. Shipping weight 45
lbs.

That's what you're looking for—shears that will save money for you—shears that stand the gaff.

Install at least one type of Marshalltown throatless shears in your shop. Do it now!

**SHEARS FOR EVERY
JOB: CUTTING CAPAC-
ITY UP TO $\frac{1}{2}$ ".**

The MARSHALLTOWN line is complete—a shear for every use.

**THE CATALOGUE TELLS
THE STORY—WRITE FOR
IT**

MARSHALLTOWN MFG. CO.

MARSHALLTOWN
IOWA



They're Almost As Strong for Handy Pipe As We Are!

Listen to this quotation from a letter from a firm that has used HANDY PIPE for 17 years:

"We have carefully examined other makes, and can honestly say that we could not 'keep house' without HANDY pipe.

"We feel sure that HANDY pipe, once used, will be always used by conscientious workmen and contractors."

(Name on request)

If you haven't received our new catalogue—or if you want a free handy bullet pencil just ask for them.

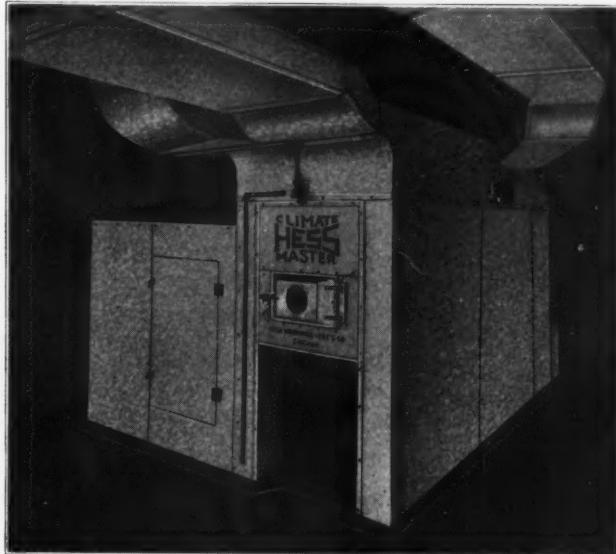
F. MEYER & BRO. CO.

Peoria, Illinois



ACT NOW!

IF YOU WANT
To SELL
AIR
CONDITIONING
SYSTEMS
THIS FALL



Basement Installation Hess Indoor Climate Control System

We receive letters from new dealers and contractors every week asking about air conditioning. Maybe you, too, are considering this profitable market. Why not get started right, and without further delay? We will show you how to meet the ever increasing demand for this modern method of heating—a system that provides year 'round comfort—cool in summer and warm in winter. Write us now.

For Your Regular Furnace Jobs, Too

For over 50 years Hess has pioneered the way. Hess Welded Steel Furnaces without cemented joints do not leak. They stay tight at all times and deliver an abundance of clean heat at low cost. Furnished if desired with automatic heat regulator, blower and automatic humidifier at prices equal to or lower than ordinary furnaces.

Whatever you prefer—air conditioning or regular furnace work—ask Hess for prices and complete information.

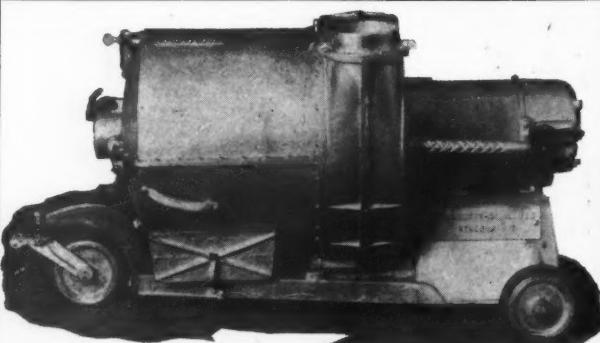
Hess Warming & Ventilating Company

1201-1211 S. Western Ave., Chicago, Ill.

Branches: Detroit—Milwaukee

HESS
WELDED STEEL FURNACES
INDOOR CLIMATE CONTROL
SYSTEM

Mention AMERICAN ARTISAN in your reply—Thank you!



CLEANING POWER

That's what we offer with a "D. Q." Cleaner. Power to perform quickly and satisfactorily. That "Extra Power" which puts a profit in your pocket.

THE "D. Q." CLEANER IS LIGHT IN WEIGHT, BUT POWERFUL IN PERFORMANCE



Fully guaranteed and operates on any ordinary house current A.C. or D.C. 110 to 125 Volts.

Densmore-Quinlan Co.
Kenosha, Wisconsin

Write for This Illustrated Folder for Full "D.Q." Data



"Do it for the last time with COPPER"

is the title of this new selling help prepared by The American Brass Co. to help contractors secure more Anaconda Copper jobs. This folder, and others like it, are supplied free of charge and in reasonable quantities to contractors using Anaconda Copper—specially imprinted with their firm names and addresses. Write today for a supply. The American Brass Co., General Offices: Waterbury, Conn.

ANACONDA COPPER

Don't Depend on Lady Luck!

Select a furnace of proven merit and reliability
the ~

X-L-ALL RUGGED STEEL Warm Air Furnace

The first unit installed ten years ago is still in operation. Here you have a scientifically assembled furnace with standard code rating now newly improved by a 59-year old concern.



Patent Applied For

THE DESHLER FOUNDRY & MACHINE WORKS,
140-142 S. East Ave., Deshler, Ohio.

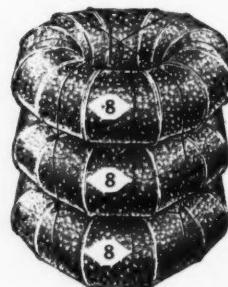
Please send me without obligation

The X-L-ALL Furnace Book.

The X-L-ALL Dealer Proposition.

Name..... Street..... City..... A.A.

Say you saw it in AMERICAN ARTISAN—Thank you!



FOR GOOD RESULTS

USE

ADJUSTABLE

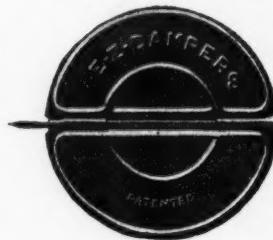
E-Z

ELBOWS AND DAMPERS

The Elbow you will eventually use. Why not now?

Snap and it's off—

Tap and it's on—



Will appeal to you especially for their EASY manipulation. The E-Z patented feature insures trouble-proof installation and positive lock. The all-steel notched spindle snaps into place—no work, no worry. E-Z Dampers save time and temper.

The E-Z Damper is made of durable metal. Its selling feature is the built-in snap lock which is an E-Z patent.

**Acme Tin Plate & Roofing Supply Co.
2401-03 N. 10th St. Philadelphia, Pa.**

Manufacturers of Elbows, Pipe, Furnace Fittings and Dampers.



MASTER HEAT REGULATOR

TYPE 22

Show your customers! Every sale of this dependable equipment gives you handsome profits. Write us for details and discounts.

WHITE MANUFACTURING COMPANY
2362 University Avenue St. Paul, Minn.
Also makers of Gradual Operation Regulators

HEAT RADIATING FINS

The Fins...
Tell a Story—



**HALL-NEAL
VICTOR**

Let us tell you more

HALL-NEAL FURNACE COMPANY
1324 Capitol Avenue Indianapolis, Indiana



They Tell You
WHY!

The Hall-Neal Victor operates more efficiently on less fuel. Why—the Hall-Neal Victor is easier to sell and makes an unusual dealer proposition.

CLEANER DAYS ARE HERE!

The Brillion Furnace Cleaner Will
Do the Work!

We'll Help You Get the Good
Jobs! Investigate!

**BRILLION FURNACE CO.
BRILLION
WIS.**

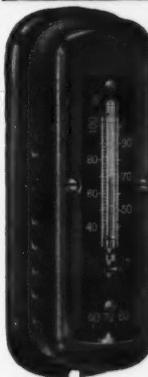


Only One of the Brillion Helps—A Return Postal That
Gets the Business

H & C AUTOMATIC HEAT CONTROL

QUALITY and LOW PRICE
GO HAND in HAND

in



Let the search for your best bet in automatic heat regulators be as extensive as the field itself. Probe deeply into mechanical and structural qualities and you will find, as hundreds have already found, that the H & C combines ALL the qualities you and your customers insist upon—plus a LOW PRICE that spells unequalled value.

If you haven't already tried the H & C phone
your Jobber an order today!

HART & COOLEY MFG. CO.
61 W. Kinzie St.
Chicago

Dealer Price
\$24.50

Including Every
Necessary Fitting.
Sells for \$45.00
plus installation.

~ MARKET QUOTATIONS ~

AMERICAN ARTISAN is the only publication quoting Prices on Metals, Sheet Metal Equipment and Supplies, Warm Air Heating Supplies and Accessories, corrected bi-weekly. These quotations are not guaranteed but are obtained from reliable sources and reflect nation-wide market conditions at the time of going to press.

NOTE—These prices are Chicago Warehouse Prices to which must be added territory differentials

METALS

PIG IRON

Chicago Fly., No. 2.....	\$17.50
Southern Fly., No. 2.....	17.01
Lake Superior Charcoal.....	27.04
Malleable.....	17.50

FIRST QUALITY BRIGHT CHARCOAL TIN PLATES

IC 20x28 112 sheets.....	\$23.80
IX 20x28.....	27.45
IXX 20x28 56 sheets.....	14.95
XXXX 20x28.....	16.10
IC 20x28.....	17.35

TERNE PLATES

Per Box	
IC 20x28, 40-lb.	112 sheets.....\$22.50
IX 20x28, 40-lb.	112 sheets.....25.00
IC 20x28, 25-lb.	112 sheets.....19.60
IX 20x28, 25-lb.	112 sheets.....22.10
IC 20x28, 20-lb.	112 sheets.....18.25
IX 20x28, 20-lb.	112 sheets.....20.75

"ARMCO" INGOT IRON PLATES	
No. 8 ga.—110 lbs.....	\$4.15
8/16 in.—100 lbs.....	4.05
1/4 in.—100 lbs.....	3.85

COKE PLATES

Cokes, 80 lbs., base, 20x28.....	\$12.00
Cokes, 90 lbs., base, 20x28.....	12.20
Cokes, 100 lbs., base, 20x28.....	13.75
Cokes, 107 lbs., base, IC, 20x28.....	12.75
Cokes, 135 lbs., base, IX, 20x28.....	14.75
Cokes, 155 lbs., base, 2X, 56 sheets.....	8.50
Cokes, 175 lbs., base, 3X, 56 sheets.....	9.35
Cokes, 195 lbs., base, 4X, 56 sheets.....	10.25

HOT ROLLED ANNEALED SHEETS

Base 10 ga.....per 100 lb.	\$3.25
"Armco" 10 ga.....per 100 lbs.	4.15

HOT ROLLED ANNEALED SHEETS 16 GA. AND HEAVIER

No. 18.....per 100 lbs.	\$3.25
No. 20.....per 100 lbs.	3.35
No. 22.....per 100 lbs.	3.45
No. 24.....per 100 lbs.	3.55
No. 26.....per 100 lbs.	3.65
No. 27.....per 100 lbs.	3.70
No. 28.....per 100 lbs.	3.80

GALVANIZED

No. 16.....per 100 lbs.	\$3.70
No. 18.....per 100 lbs.	3.80
No. 20.....per 100 lbs.	3.90
No. 22.....per 100 lbs.	4.00
(Standard differentials on extras to apply)	

No. 24.....per 100 lbs.	\$4.10
No. 26.....per 100 lbs.	4.35
No. 27.....per 100 lbs.	4.45
No. 28.....per 100 lbs.	4.60
"Armco" 24.....per 100 lbs.	5.75

BAR SOLDER

Warranted 50-50.....per 100 lbs.	\$19.25
45-55.....per 100 lbs.	17.00
48-52.....per 100 lbs.	17.75
Plumbers'.....per 100 lbs.	15.50

ZINC	
In Slabs.....	\$5.00

SHEET ZINC

Cask Lots (600 lbs.).....	\$12.00
Sheet Lots (100 lbs.).....	13.00

BRASS	
Sheets, Chicago base.....	16 1/2 c
Tubing, seamless, Chicago base.....	20 1/2 c
Wire, Chicago base.....	16 1/2 c
Rods, Chicago base.....	13 1/2 c

COPPER

Sheets, Chicago base.....	18 1/2 c
Tubing, seamless, Chicago base.....	20 1/2 c
Wire, plain rd., 8 B. & S. Ga. and heavier.....	12 1/2 c

LEAD

American Pig.....	\$6.00
Bar.....	7.50

TIN

Bar Tin.....	per 100 lbs. \$33.00
Pig Tin.....	per 100 lbs. 32.00

SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES

ASBESTOS

Paper up to 1/16.....	.6c per lb.
Roll board.....	6 1/2 c per lb.
Mill board, 3/32 to 1/4.....	6 1/2 c per lb.
Corrugated paper (250 sq. ft. per roll).....	\$4.25 per roll
Pipe joint tape, per 500 lineal feet.....	\$1.50

ASBESTOS SEGMENTS

8 in.....	per 25 sets \$1.50
9 in.....	per 25 sets 1.75
10 in. cans, net.....	2.00
12 in.....	per 25 sets 2.50

CEMENT, FURNACE

5-lb. cans, net.....	\$0.40
10-lb. cans, net.....	0.80
25-lb. cans, net.....	2.00
Per 100 lbs.....	7.50

CUT-OFFS

Gal. plain, round or cor. rd.....	30 %
28 gauge.....	35 %

DAMPERS

Yankee Warm Air.....	\$1.00
7 inch, doz.....	2.20
8 inch, doz.....	2.60
9 inch, doz.....	2.80
10 inch, doz.....	3.50
12 inch, doz.....	5.00

ELBOWS

Conductor Pipe.....	60-10 %
28 gauge.....	50 %
24 gauge.....	15 %

Galvanized Terne Steel

Plain Rd. and Rd. Corr.....	60-10 %
28 gauge.....	50 %
24 gauge.....	15 %

Square Corrugated

28 gauge.....	55 %
26 gauge.....	40 %
Not nested.....	70 & 5 %
Nested solid.....	70 & 5 %

Portico

Standard Gauge Conductor Pipe, plain or corrugated.....	55 %
28 gauge.....	40 %

Copper

16 oz., all designs.....	50 %
Zinc.....	60 %

Zinc

16 oz., all designs.....	50 %
Zinc.....	60 %

ELBOWS

Conductor.....	60-10 %
28 gauge.....	50 %
24 gauge.....	15 %

HANGERS

Conductor Pipe.....	25 %
Milcor Perfection Wire.....	10 %

Eaves Trough

Steel (galv. after forming), from list.....	45 %
Selflock E. T. Wire, List.....	10 %

Hooks

Conductor.....	15 %
"Direct Drive" Wrought Iron, for wood or brick.....	15 %

MITRES

Galvanized Steel Mitres.....

RIVAL STRAP CORP. 308 WEST 20th ST.
NEW YORK, N.Y.

THE RIVAL AND FITRITE

One-Piece Ornamental Leader Straps
Patented July 10th, 1928; Jan. 6th, 1931

Made in six styles. Write for folder showing complete line and sizes.
STRAPS SOLD THRU JOBBERS ONLY

BEWARE OF IMITATIONS

"FITRITE" Mop Heads & Staples
Malleable Iron

Write Dept. "A" for full details and prices

"FITRITE" SKYLIGHT GEARING
Iron or Bronze $\frac{3}{8}$ " - $\frac{1}{2}$ " and 1" sizes
Made also for chain operation

"FITRITE" Adjustable PIPE SNOW GUARDS
Galvanized Iron or Bronze

"FITRITE" Bronze ROOF STRAINERS
Type "X"
3 Types. For Roofs having inside cast iron leader. Type "X" (illustrated) also made in Malleable Iron

"FITRITE" Bronze BEEHIVE STRAINERS
For Round Leaders
3"-4"-5"-6"-7"-8" Diameter

DAVID LEVOW 308 WEST 20^{ST.}
NEW YORK

A Heat Hustler Fan Forces Air Through a Single Warm Air Pipe

Heats garages, sun porches and other rooms that will not heat by gravity. Mounts directly in the warm air pipe. Draws heat from the furnace and forces it into the hard-to-heat room. Quick heat for a bathroom.

Four reasons why you should use the American Heat Hustler:

1. It uses a positive pressure, rotary type fan.
2. Motor is outside the warm air flow, adding greatly to life of motor and leaving as much space for gravity air flow as before the Heat Hustler was installed.
3. It is quiet.
4. Furnished for either automatic or manual control.

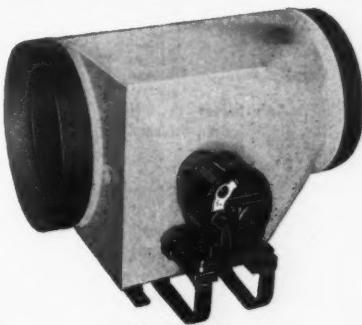
Price list, with descriptive literature showing different models, sizes, etc., will be sent you by return mail upon receipt of your request. CLIP AND SEND THIS AD IN NOW!

AMERICAN FOUNDRY & FURNACE COMPANY

Bloomington,

World's largest manufacturers
of blower furnace systems

Illinois



PATENTED

RYERSON

IMMEDIATE SHIPMENT FROM STOCK

More than twenty kinds of prime quality sheets are carried in stock. There is a special sheet for every purpose. Also Bars, Angles, Rivets, Bolts, Tools and Metal-Working Machinery.

Write for Journal and Stock List

JOSEPH T. RYERSON & SON INC.

Chicago
Detroit

Milwaukee
St. Louis

Jersey City
Cincinnati

Buffalo
Cleveland

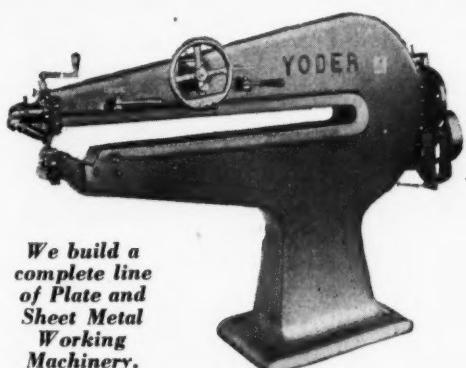
Philadelphia
Boston

SHEETS

THE WORLD'S LARGEST
MANUFACTURERS OF
STEEL FURNACES

LENNOX
FURNACE CO., INC.

MARSHALLTOWN, IOWA
SYRACUSE, NEW YORK



We build a
complete line
of Plate and
Sheet Metal
Working
Machinery.

Yoder No. S-60 Rotary Shear

This shear with 60" gap to accommodate large sheets, will cut any weight of sheet metal up to 14 gauge. It can be used for short curves in any direction and will cut circles without running in from the side of material. This machine has two speeds controlled by hand lever and is equipped with a Yoder friction clutch. Write for further information.

THE YODER COMPANY
W. 55 ST. and WALWORTH AVE.
CLEVELAND, OHIO
PLATE AND SHEET METAL MACHINERY SPECIALISTS

Harry G. Masten Company, 4119 N. Lawler Ave., Chicago Sales Representative

Mention AMERICAN ARTISAN in your reply—Thank you!

BUYERS' DIRECTORY

Air Cleaners

American Fdy. & Furnace Co., Bloomington, Ill.
Independent Air Filter Co., Chicago, Ill.
Kleenair Filter Co., Stevens Point, Wis.
Meyer & Bro., F., Peoria, Ill.
Watt Mfg. Co., Sterling, Ill.

Air Washers

American Machine Products Co., Marshalltown, Iowa
Brundage Co., Kalamazoo, Mich.
A. Gehri & Co., Tacoma, Wash.
Watt Mfg. Co., Sterling, Ill.

Asbestos—Liquid

Technical Products Co., Pittsburgh, Pa.

Asbestos Covering

Standard Asbestos Co. of Chicago, Chicago, Ill.
Wilson, Grant, Inc., Chicago, Ill.

Asbestos Paper

Standard Asbestos Co. of Chicago, Chicago, Ill.
Wilson, Grant, Inc., Chicago, Ill.

Ash Sifter

Diener Mfg. Co., G. W., Chicago, Ill.

Blast Gates

Berger Bros. Co., Philadelphia, Pa.

Blowers

American Fdy. & Furnace Co., Bloomington, Ill.

American Machine Products Co., Marshalltown, Iowa

Brundage Co., Kalamazoo, Mich.

Emerson Elec. Mfg. Co., St. Louis, Mo.

A. Gehri & Co., Tacoma, Wash.

Henry Furnace & Fdy. Co., Cleveland, Ohio

Lakeside Co., Hermansville, Mich.

Watt Mfg. Co., Sterling, Ill.

Belts—Stove

Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Brakes—Bending

Dreis & Krump Mfg. Co., Chicago, Ill.
Interstate Machinery Co., Chicago, Ill.

Peck, Stow & Wilcox Co., Southington, Conn.

Ryerson, & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Brakes—Cornice

Dreis & Krump Mfg. Co., Chicago, Ill.

Brass and Copper

American Brass Co., Waterbury, Conn.
Revere Copper and Brass Inc., Rome, N. Y.

Cans—Garbage

Diener Mfg. Co., G. W., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Castings—Malleable

Fanner Mfg. Co., Cleveland, Ohio

Ceilings—Metal

Globe Iron Roofing and Corrugating Co., Cincinnati, Ohio

Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.

Chaplets

Fanner Mfg. Co., Cleveland, Ohio

Cleaners—Vacuum

Baker Furnace Co., Toledo, Ohio
Brilliant Furnace Co., Brilliant, Wis.

Densmore & Quinlan Co., Kenosha, Wis.

National Super Service Co., Toledo, Ohio

Osborn Co., The J. M., & L. A., Cleveland, Ohio

Conductor Elbows and Shoes

Acme Tin Plate & Rfg. Supply Co., Philadelphia, Pa.

Barnes Metal Products Co., Chicago, Ill.

Berger Bros. Co., Philadelphia, Pa.

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio

Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.

Conductor Fittings

Acme Tin Plate & Rfg. Supply Co., Philadelphia, Pa.

Barnes Metal Products Co., Chicago, Ill.

Berger Bros. Co., Philadelphia, Pa.

Braden Mfg. Co., Terre Haute, Ind.

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio

David Levow, New York, N. Y.

Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.

Rival Strap Corp., New York, N. Y.

Conductor Pipe

Acme Tin Plate & Rfg. Supply Co., Philadelphia, Pa.

Barnes Metal Products Co., Chicago, Ill.

Berger Bros. Co., Philadelphia, Pa.

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio

Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.

Copper

American Brass Co., Waterbury, Conn.

Revere Copper and Brass Inc., Rome, N. Y.

Cornices

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio

Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.

Crimping Machines

Bertsch & Co., Cambridge City, Ind.

Yoder Co., The, Cleveland, Ohio

Cut-offs—Rain Water

Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.

Dampers—Quadrants—Accessories

Acme Tin Plate & Rfg. Supply Co., Philadelphia, Pa.

Aeolus Dickinson, Chicago, Ill.

Hart & Cooley Co., Holland, Mich.

Howes Co., S. M., Boston, Mass.

Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.

Parker-Kalon Corp., New York, N. Y.

Young Ventilating Co., Cleveland, Ohio

Dampproofings

Lastik Products Corp., Pittsburgh, Pa.

Diffusers—Air Duct

Aeolus Dickinson, Chicago, Ill.

Drills—Electric

J. M. & L. A. Osborn Co., Cleveland, Ohio

Drive Screws—Hardened Metallic

Parker-Kalon Corp., New York

Eaves Trough

Acme Tin Plate & Rfg. Supply Co., Philadelphia, Pa.

Barnes Metal Products Co., Chicago, Ill.

Berger Bros. Co., Philadelphia, Pa.

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio

Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.

Eaves Trough Hangers

Acme Tin Plate & Rfg. Supply Co., Philadelphia, Pa.

Berger Bros. Co., Philadelphia, Pa.

Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.

Fans—Exhaust

Emerson Elec. Mfg. Co., St. Louis, Mo.

Fans—Ventilating

Emerson Elec. Mfg. Co., St. Louis, Mo.

Fluxes—Soldering

Kester Solder Co., Chicago, Ill.

Ryerson, & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Forming Rolls

Bertsch & Co., Cambridge City, Ind.

Interstate Machinery Co., Chicago, Ill.

Furnaces—Gas Auxiliary**Furnace Cement**

Connors Paint Mfg. Co., Wm., Troy, N. Y.

Lastik Products Corp., Pittsburgh, Pa.

Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.

Technical Products Co., Pittsburgh, Pa.

Furnace Chain

Hart & Cooley Co., Holland, Mich.

Furnace Cleaners—Suction

Bauer Furnace Co., Toledo, O.

Brilliant Furnace Co., Brilliant, Wis.

Densmore & Quinlan Co., Kenosha, Wis.

National Super Service Co., Toledo, Ohio

J. M. & L. A. Osborn Co., Cleveland, Ohio

Furnace Door Handles

Fauner Mfg. Co., Cleveland, Ohio

Furnace Fans

A-C Mfg. Co., Pontiac, Ill.

American Fdy. & Furnace Co., Bloomington, Ill.

Emerson Elec. Mfg. Co., St. Louis, Mo.

St. Louis, Mo.

Furnace Filters

Independent Air Filter Co., Chicago, Ill.

Kleenair Filter Co., Stevens Point, Wis.

Lakeside Co., Hermansville, Mich.

Furnace Pipe and Fittings

Henry Furnace & Fdy. Co., Cleveland, Ohio

Meyer & Bro. F., Peoria, Ill.

Milcor Steel Co., Cleveland, Ohio

Osborn Co., The J. M. & L. A., Cleveland, Ohio

Peerless Foundry Co., Indianapolis, Ind.

Williamson Heater Co., Cincinnati, Ohio

Furnace Pokers

Fanner Mfg. Co., Cleveland, Ohio

Furnace Pulleys

Hart & Cooley Co., Holland, Mich.

Furnace Regulators

Hart & Cooley Co., Holland, Mich.

Lakeside Co., Hermansville, Mich.

Modern Heat Regulator Co., Cleveland, Ohio

Minneapolis Honeywell Regulator Co., Minneapolis, Minn.

White Mfg. Co., Minneapolis, Minn.

Furnaces for Gas or Oil

A. G. Brauer Supply Co., St. Louis, Mo.

Northwestern Stove Repair Co., Chicago, Ill.

Furnace Rings

Forest City Foundries Co., Cleveland, Ohio

Furnaces—Gas

American Fdy. & Furnace Co., Bloomington, Ill.

American Furnace Co., St. Louis, Mo.

Henry Furnace and Foundry Co., Cleveland, Ohio

Lenox Furnace Co., Marshalltown, Iowa

Meyer Furnace Co., Peoria, Ill.

Payne Furnace & Supply Co., Beverly Hills, Calif.

Wise Furnace Co., Akron, Ohio

Western Steel Products Co., Duluth, Minn.

Duluth, Minn.

Furnaces—Oil Burning

Motor Wheel Corp., Heater Div., Lansing, Mich.

Heaters—Cabinet

Agricola Furnace Co., Gadsden, Ala.

Motor Wheel Corp., Heater Division, Louisville, Mich.

Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

Payne Furnace & Supply Co., Beverly Hills, Calif.

Premier Warm Air Heater Co., Dowagiac, Mich.

Waterman-Waterbury Co., Minneapolis, Minn.

Heaters—School Room

Meyer Furnace Co., The, Peoria, Ill.

Western Steel Products Co., Duluth, Minn.

Waterman-Waterbury Co., Minneapolis, Minn.

Minneapolis, Minn.

Humidifiers

Automatic Humidifier Co., Cedar Falls, Iowa

Dienier Mfg. Co., G. W., Chicago, Ill.

Meyer & Bro. Co., F., Peoria, Ill.

Lakeside Co., Hermansville, Mich.

Sallada Mfg. Co., Minneapolis, Minn.

Furnaces—Warm Air

Acme Tin Plate & Rfg. Supply Co., Philadelphia, Pa.

Agricola Furnace Co., Gadsden, Ala.

American Fdy. & Furnace Co., Bloomington, Ill.

Armstrong Furnace Co., Columbus, O.

Brilliant Furnace Co., Brilliant, Wis.

Dall Steel Products Co., Lansing, Mich.

Deshler Foundry & Machine Works, Deshler, Ohio

Economy Boiler Co., Ann Arbor, Mich.

Enterprise Boiler & Tank Works, Chicago, Ill.

Forest City Foundries Co., Cleveland, Ohio

General Heating Co., St. Paul, Minn.

Graff Furnace Co., Scranton, Pa.

Hall-Neal Furnace Co., Indianapolis, Ind.

Henry Furnace & Fdy. Co., Indianapolis, Ind.

Hess Warming and Ventilating Co., Chicago, Ill.

Lennox Furnace Co., Marshalltown, Iowa

Liberty Foundry Co., St. Louis, Mo.

May Flebeger Furnace Co., Newark, Ohio

Meyer Furnace Co., The, Peoria, Ill.

Midland Furnace Co., Columbus, Ohio

Motor Wheel Corp., Heater Div., Lansing, Mich.

Payne Furnace & Supply Co., Beverly Hills, Calif.

Peerless Foundry Co., Indianapolis, Ind.

Premier Warm Air Heater Co., Dowagiac, Mich.

Willow Furnace Co., Youngstown, Ohio

Western Steel Products Co., Duluth, Minn.

Willow Furnace Co., Duluth, Minn.

Humidifiers

(Continued on page 46)

Say you saw it in AMERICAN ARTISAN—Thank you!

PERFORATED METAL GRILLES
OF EVERY TYPE
SQUARE PERFORATIONS—IMITATION CANE and OTHER DESIGNS
For Ventilating Outlets, Warm or Cold Air Vents, Radiator Covers, etc.
Made to your specifications—in Steel, Brass, Bronze, etc.
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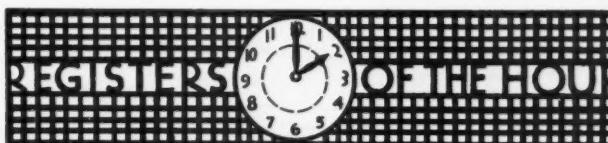
Requires Little Floor Space	Provides Ample Gravity Flow	Easy to Install
Saves Fuel	Quiet in Operation	

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Thermostatic—All-Electric Fully Guaranteed
Can be installed on any warm air furnace.
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The High Efficiency,
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ANY SIZE . . ANY FINISH
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INDEPENDENT

INDEPENDENT REGISTER & MFG. CO.
3741 East 93rd Street Cleveland, Ohio

BUYERS' DIRECTORY

(Continued from page 44)

Registers—Wood	Sheets—Alloy	Solder—Self-Fluxing
American Wood Register Co., Plymouth, Ind. Auer Register Co., Cleveland, Ohio Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.	Inland Steel Co., Chicago, Ill. International Nickel Co., New York, N. Y. Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C. Newport Rolling Mill Co., Newport, Ky. Osborn Co., The J. M. & L. A., Cleveland, Ohio Republic Steel Corp., Youngstown, Ohio Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.	Kester Solder Co., Chicago, Ill. Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Machinery—Culvert	Repairs—Stove and Furnace	Soldering Furnaces
Bertsch & Co., Cambridge City, Ind. Interstate Machinery Co., Chicago, Ill.	Brauer Supply Co., A. G., St. Louis, Mo. Northwestern Stove Repair Co., Chicago	Diener Mfg. Co., G. W., Chicago, Ill. Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Machinery—Rebuilt	Ridging	Specialties—Hardware
Interstate Machinery Co., Chicago, Ill.	Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.	Diener Mfg. Co., G. W., Chicago, Ill.
Machines—Tinsmith's	Roofing Cement	Stars—Hard Iron Cleaning
Bertsch & Co., Cambridge City, Ind. Dreis & Krump Mfg. Co., Chicago, Ill. Interstate Machinery Co., Chicago, Ill. Marshalltown Mfg. Co., Marshalltown, Iowa Osborn Co., The J. M. & L. A., Cleveland, Ohio Parker-Kalon Corp., New York Peck, Stow & Wilcox Co., Southington, Conn. Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve. Viking Shear Co., Erie, Pa. Whitney Mfg. Co., W. A., Rockford, Ill. Yoder Co., The, Cleveland, O.	Connors Paint Mfg. Co., Wm., Troy, N. Y. Lastik Products Corp., Pittsburgh, Pa.	Fanner Mfg. Co., Cleveland, Ohio
Metal Lath—Expanded	Roof Flashing	Stove Pipe and Fittings
Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.	Globe Iron Roofing and Corrugating Co., Cincinnati, Ohio Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.	Meyer & Bro. Co., F., Peoria, Ill. Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.
Meters	Roof Paints	Stove and Furnace Trimmings
Barnes Metal Products Co., Chicago, Ill. Berger Bros. Co., Philadelphia, Pa. Braden Mfg. Co., Terre Haute, Ind. Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.	Connors Paint Mfg. Co., Wm., Troy, N. Y. Lastik Products Corp., Pittsburgh, Pa.	Fanner Mfg. Co., Cleveland, Ohio
Motors—Electric	Sheets—Copper	Strainers—Roof
Emerson Elec. Mfg. Co., St. Louis, Mo.	American Brass Co., Waterbury, Conn. Revere Copper and Brass Inc., Rome, N. Y.	David Levow, New York, N. Y. Rival Strap Corp., New York, N. Y.
Nails—Hardened Masonry	Sheets—Iron	Straps—Ornamental Pipe
Parker-Kalon Corp., New York, N. Y.	Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C. Newport Rolling Mill Co., Newport, Ky. Osborn Co., The J. M. & L. A., Cleveland, Ohio Republic Steel Corp., Youngstown, Ohio Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.	David Levow, New York, N. Y. Rival Strap Corp., New York, N. Y.
Oil Burners	Roofing—Iron and Steel	Tinplate
Laco Oil Burner Co., Griswold, Iowa McLain Burner Corp., Evanston, Ill. Northern Oil Burners Inc., Minneapolis, Minn. Silent Automatic Corp., Detroit, Mich.	Globe Iron Roofing and Corrugating Co., Cincinnati, Ohio Inland Steel Co., Mill, Canton, Chgo., La Crosse, K. C. Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C. Newport Rolling Mill Co., The, Newport, Ky. Osborn Co., The J. M. & L. A., Cleveland, Ohio Republic Steel Corp., Youngstown, Ohio Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.	Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C. Newport Rolling Mill Co., The J. M. & L. A., Cleveland, Ohio Osborn Co., The J. M. & L. A., Cleveland, Ohio Republic Steel Corp., Youngstown, Ohio Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Paint	Roofing—Tin and Terne	Tools—Tinsmith's
Connors Paint Mfg. Co., Wm., Troy, N. Y.	Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C. Osborn Co., The J. M. & L. A., Cleveland, Ohio Republic Steel Corp., Youngstown, Ohio Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.	Bertsch & Co., Cambridge City, Ind. Dreis & Krump Mfg. Co., Chicago, Ill. Interstate Machinery Co., Chicago, Ill. Marshalltown Mfg. Co., Marshalltown, Iowa Osborn Co., The J. M. & L. A., Cleveland, Ohio Parker-Kalon Corp., New York, N. Y. Peck, Stow & Wilcox Co., Southington, Conn. Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve. The Stanley Electric Tool Co., New Britain, Conn. Viking Shear Co., Erie, Pa. Whitney Mfg. Co., W. A., Rockford, Ill.
Perforated Metals	Rubbish Burners	Torches
Chicago Perforating Co., Chicago Harrington & King Perforating Co., Chicago, Ill.	Hart & Cooley Co., Holland, Mich.	Diener Mfg. Co., G. W., Chicago, Ill. Osborn Co., The J. M. & L. A., Cleveland, Ohio Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Punches	School—Sheet Metal Pattern Drafting	Vacuum Cleaners—Furnace
Bertsch & Co., Cambridge City, Ind. Interstate Machinery Co., Chicago, Ill. Parker-Kalon Corp., New York Kyron, & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve. W. A. Whitney Mfg. Co., Rockford, Ill.	St. Louis Technical Institute, St. Louis, Mo.	Baker Furnace Co., Toledo, O. Brillion Furnace Co., Brillion, Wis. Desmore & Quillian Co., Kenosha, Wis. National Super Service Co., Toledo, Ohio J. M. & L. A. Osborn Co., Cleveland, Ohio
Punches—Combination Bench and Hand	Schools—Warm Air Heating	Ventilators—Ceiling
Parker-Kalon Corp., New York, N. Y.	St. Louis Technical Institute, St. Louis, Mo.	Hart & Cooley Co., New Britain, Conn. Henry Furnace & Fdy. Co., Cleveland, Ohio Independent Reg. & Mfg. Co., Cleveland, O.
Punches—Hand	Screws—Hardened Metallic Drive	Ventilators—Floor
Parker-Kalon Corp., New York, N. Y. W. A. Whitney Mfg. Co., Rockford, Ill.	Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C. Parker-Kalon Corp., 200 Varick St., New York	Aeolus Dickinson, Chicago, Ill.
Putty-Stove	Screws—Hardened Self-Tapping, Sheet Metal	Ventilators—Roof
Connors Paint Mfg. Co., Wm., Troy, N. Y.	Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C. Parker-Kalon Corp., New York	Aeolus Dickinson, Chicago, Ill. Berger Bros. Co., Philadelphia, Pa. Burt Mfg. Co., Akron, O. Paul R. Jordan & Co., Indianapolis, Ind. Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.
Radiator Cabinets	Screens—Perforated Metal	Wood Faces—Warm Air
Hart & Cooley Co., New Britain, Conn. Tuttle & Bailey Mfg. Co., New York	Harrington & King Perforating Co., Chicago, Ill.	Auer Register Co., Cleveland, Ohio Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C.
Registers—Warm Air	Scuppers	
Auer Register Co., Cleveland, Ohio Forest City Foundries Co., Cleveland, Ohio Hart & Cooley Mfg. Co., Chicago, Ill. Henry Furnace & Fdy. Co., Cleveland, Ohio Independent Register & Mfg. Co., Cleveland, Ohio Meyer & Bro. Co., F., Peoria, Ill. Milcor Steel Co., Mill, Canton, Chgo., La Crosse, K. C. Rock Island Register Co., Rock Island, Ill. Symonds Register Co., St. Louis, Mo. Tuttle & Bailey Mfg. Co., New York United States Register Co., Battle Creek, Mich. Williamson Heater Co., Cincinnati, Ohio	Aeolus Dickinson, Chicago, Ill.	
Shears—Hand and Power	Shears—Hand and Power	
Interstate Machinery Co., Chicago, Ill. Marshalltown Mfg. Co., Marshalltown, Iowa Peck, Stow & Wilcox Co., Southington, Conn. Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve. Viking Shear Co., Erie, Pa. Yoder Co., The, Cleveland, O.	Interstate Machinery Co., Chicago, Ill. Marshalltown Mfg. Co., Marshalltown, Iowa Peck, Stow & Wilcox Co., Southington, Conn. Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve. Viking Shear Co., Erie, Pa. Yoder Co., The, Cleveland, O.	
Sheet Metal Screws—Hardened, Self-Tapping	Solder—Acid Core	
Parker-Kalon Corp., New York	Parker-Kalon Corp., New York	Kester Solder Co., Chicago, Ill.
Solder—Rosin Core	Solder—Self-Fluxing	
	Kester Solder Co., Chicago, Ill.	

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A fuel saver and generating machine of the finest quality made at the price.

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Asbestos Paper 8-10-12-14-16-32 lbs. per 100 square feet. 18" and 36" wide— 50 or 100 lb. Rolls		Corrugated Asbestos Board A flexible insulation $\frac{3}{8}$, $\frac{1}{2}$ or $\frac{3}{4}$ inch thick. Especially adapted for wrapping furnace pipes.
		Standard Asbestos Mfg. Co. (Ohio) 5808 Euclid Ave. Cleveland O.
Standard Asbestos Mfg. Co. (Illinois) 2333 Pine St. St. Louis		

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Compound lever handle—removable blades. Upper blade away from mechanic enabling easy following of work—an exclusive Viking feature.



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Then file it for future reference. You never know when you will encounter a problem in your business that is covered in this very issue.

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caps; outlets; pipe hooks; fasteners; gutter hangers

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IT

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Classified Advertising

BUSINESS CHANCES

Lightning Rods—Dealers who are selling Lightning Protection will make money by writing to us for our latest Factory to Dealer Prices. We employ no salesmen and save you all overhead charges. Our Pure Copper Cable and Fixtures are endorsed by the National Board of Fire Underwriters and hundreds of dealers. Write today for samples and prices. L. K. Diddle Company, Marshfield, Wis.

For Sale—Sheet metal shop in southwest Kansas. Must sell on account of sickness. Address Dodge City Sheet Metal Works, 307 Santa Fe Trail, Dodge City, Kansas. Z-539

For Sale—A furnace and sheet metal shop in town of 8,000, Central Iowa. A furnace agency nationally advertised, established 37 years. Only exclusive shop in town. This is an opening for a good combination man to put in plumbing also. Rent very reasonable. Have a good cleaning machine, truck, tools and stock is very clear. Cash \$2,000. Address E-540, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

For Sale—Sheet metal and furnace business in the best city in Southern Illinois. Four operations in two years leaves me in such a condition that I am not able to work. Investigate. Address F-540, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

HELP WANTED

Wanted—A sales manager to take full charge of sales for an established company manufacturing and selling a well known steel furnace.

Address L-540
AMERICAN ARTISAN
139 North Clark Street Chicago, Ill.

Wanted—A good retail furnace salesman to manage our branch at Zanesville, Ohio. Must be capable to figure and lay out own jobs. Prefer man who can also do own installing. Have plenty of live prospects to work on. Commission basis. Wonderful opportunity for the man who knows the furnace business and is willing to work. Address P. O. Box 647, Zanesville, Ohio. P-539

Wanted—A good retail furnace salesman to work in Northwestern Pennsylvania. Must be capable of figuring and laying out own jobs. Commission basis or salary and commission. Have hundreds of live prospects to work on. Wonderful opportunity for a man who knows the furnace business and is willing to work. Address H-540, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

SITUATION WANTED

Situation Wanted—Plumber, steam fitter, and tinner would like position with a good party or company. Can give best of references as to ability either at installing or handling the work. Don't mind working and will not lay down on the job. Am a lead working plumber, twenty years experience at this line of work. Address C. G. Perrin, Clifton, Wyoming. J-539

Situation Wanted—By all around sheet metal worker. Can do heating, ventilating, blow piping and fan installation work. Can do all work from blueprints. Good on any class of work that comes in a contract shop. 21 years in or with two shops. Address, D. Sigmon, 1618 East Washington Street, Indianapolis, Indiana. J-539

SITUATION WANTED

Sales and Advertising Manager

well-known in the industry and to the trade, seeks new connection with manufacturer who is interested in developing air conditioning equipment.

Broad and productive experience in all lines of heating engineering, including adaptation of refrigeration in connection with forced warm air heating systems.

Have designed several air conditioning units, and improvements in warm air furnace construction.

Member A. S. H. & V. E., A. S. M. E. Twelve years with present company.

Address J-540

AMERICAN ARTISAN
139 North Clark Street Chicago, Ill.

Situation Wanted—Competent plumber and steam fitter, good on furnace and sheet metal work, will take small town position. Refined gentleman, 42 years old, and in good health. Address Plumber, 4632 Second Boulevard, Detroit, Michigan. K-539

Situation Wanted—By combination radiator and sheet metal mechanic. Nine years' experience on all makes of auto, truck, tractor, combine and airplane radiators. Four years' experience in all kinds of sheet metal work, slate and tile roofing. State wages, hours, and whether work is steady year round or not in your reply. Address W. F. McLester, Box 213, Rockingham, N. C. A-540

Situation Wanted—By a first class all around sheet metal worker with 25 years at the trade. Can handle any kind of a job that may come to any job shop. Can also read blueprints, lay out patterns, and figure work. Can go any place. Address Geo. Collins, 417 Jones Street, Clearwater, Florida. O-539

Situation Wanted—Engineer desires connection with progressive manufacturer now planning to make a completely automatic air conditioning unit. Experienced in sales promotion and advertising. Graduate engineer. 6 years' experience. Would consider connection with progressive contractor. Address C-540, care AMERICAN ARTISAN, 139 N. Clark Street, Chicago.

Situation Wanted—By an all around handy man. Can do plumbing, steam fitting, tin work, electric wiring, and can also help in a hardware store. Have had sixteen years experience. Address S-539, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—By a young man experienced in sheet metal, plumbing and hardware. Salary is secondary to a steady job with a reliable concern. Can furnish best references. Address O. J. Farus, Juda, Wisconsin. T-539

Situation Wanted—By first class sheet metal worker, tinner and furnace man. Would like to connect with some firm in North Iowa or South Minnesota which is planning on selling in a year or two, with the privilege of buying. Best of references. Address W-539, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—By experienced sheet metal foreman. Capable mechanic in all lines. Can cut patterns and estimate. Have handled large government and state jobs. Address X-539, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—Sheet Metal salesman. Experienced. Acquainted and know the sheet metal and furnace dealers in Iowa and Northern Illinois. References and bond. Address Y-539, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—By sheet metal worker with 18 years experience in general sheet metal work and warm air heating, both gravity and conditioned. Can read blueprints, make plans, lay out patterns, figure jobs, and sell. Would like to connect with reputable company who wants good work and a profit. Illinois preferred. Address G-540, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Ill.

SITUATION WANTED

Wanted—A good opening for plumbing or plumbing and hardware man in town of 1,000 to 4,000. County seat preferred. Not too much competition. Iowa, Wisconsin, or Southern Minnesota preferred. Address D-540, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

TOOLS AND MACHINES

For Sale—One No. 105 Oster Bull Dog Die Stock and dies, cuts 1½ to 3" pipe. First check for five dollars gets it. Address Warren Plumbing and Heating Co., Warren, Ill. B-540

Wanted—Furnace suction cleaner. Must be in good condition and reasonable. Address Schwarzkopf Sheet Metal Works, Waupaca, Wisconsin.

For Sale—One 72" all steel Box and Pan Brake, almost new. Will handle 18 gauge material. Price, \$75.00. One 16" Kennedy Otto Drill Press, large size. In good shape. Price, \$50.00. Address Charles Barnum, Mankato, Minnesota. G-539

For Sale—One heavy used 30" Peck, Stow & Wilcox Bar Folder in good condition. Will bend 20 gauge. Price, \$38.00. Address D-539, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

For Sale—Power Elbo Machinery, crimper and beader—"Pexto" late design. Electric motor, shafting, pulleys and belting, all complete and as good as new—used only a few days. A bargain for someone. Details on request. Address McEwen Furnace Company, 5204 East 15th Street, Kansas City, Missouri. K-540

BOOKS

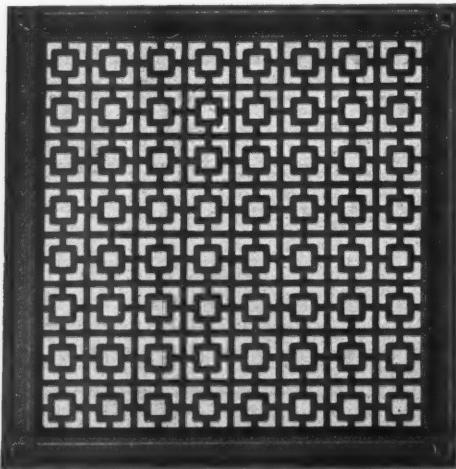
Here are the two books that most sheet metal workers and contractors classify as the most complete books on Sheet Metal Patterns Cutting. The Universal Sheet Metal Pattern Cutter, Vol. 1, deals with every phase of inside work, including Heating, Ventilating, Blower and Exhaust Piping Connections, Marine Sheet Metal Work, Automobile Sheet Metal Work, Machinery and Belt Guards, etc., Menusration applied to Sheet Metal Work, etc., with many features of construction and Labor-Saving Methods are also given in detail.

Vol. 2 deals with every form of Outside and Architectural Sheet Metal Work. A treatise on Drawing, Full Size Detailing and Lettering, Construction of Cornices, Skylights, Moldings, Copings, Electrically Illuminated Signs, etc.

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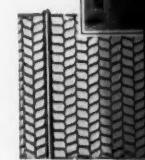
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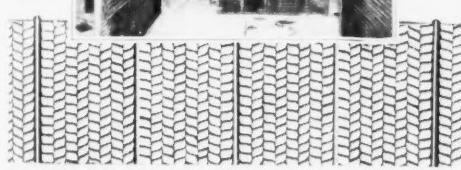
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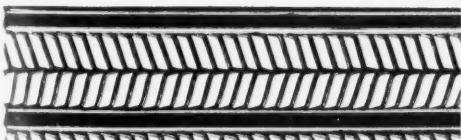
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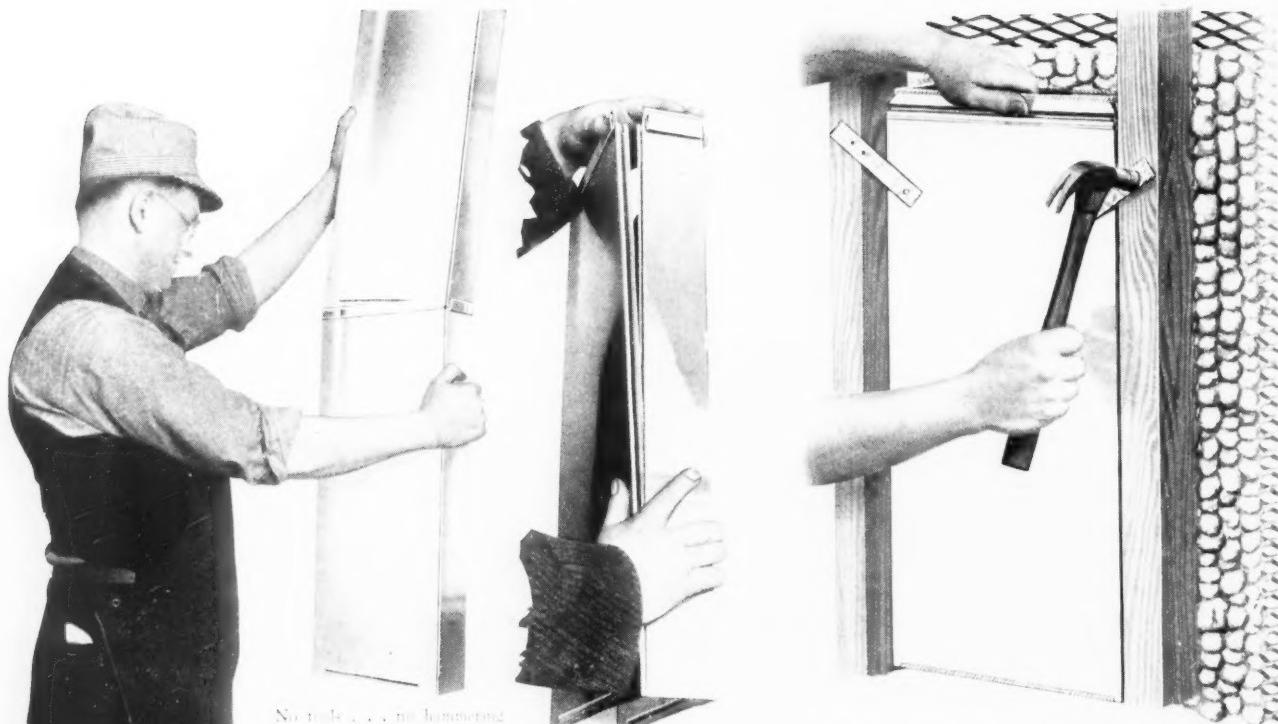
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